* Together with No. 167, Toledo Pressed Steel Co. v. Huebner Supply Co. and No. 603, Montgomery Ward & Co. v. Toledo Pressed Steel Co.

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1938

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
PETITIONER,

vs.

STANDARD PARTS, INC.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
PETITIONER,

vs.

HUEBNER SUPPLY COMPANY

ON WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT

PETITION FOR CERTIORARI FILED JULY 1, 1938.

CERTIORARI GRANTED NOVEMBER 21, 1938.

IN THE

ited States Circuit Court of Appeals

SIXTH CIRCUIT

CONSOLIDATED CAUSES

No. 1408 In Equity

ANDARD PARTS, INC.,

Appellant,

vs.

E TOLEDO PRESSED STEEL COMPANY,

Appellee.

No. 1412 In Equity

UEBNER SUPPLY COMPANY,

Appellant,

vs.

E TOLEDO PRESSED STEEL COMPANY,

Appellee.

peal from the United States District Court, for the Northern District of Ohio, Western Division

TRANSCRIPT OF RECORD

TRIAL PLEADINGS AND TESTIMONY

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Edison Bldg., Toledo, Ohio,
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and HUEBNER SUPPLY COMPANY,
Appellants.

ER & OWEN,
Nicholas Bldg., Toledo, Ohio,
Attorneys for THE TOLEDO PRESSED STEEL COMPANY,
Appellee.

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IN THE

District Court of the United States

NORTHERN DISTRICT OF OHIO,
WESTERN DIVISION, SS.

CAPTION

Record of the proceedings of the District Court of the United States within and for the Western Division of the Northern District of Ohio, in the causes and matters hereinafter stated, the same being finally disposed of at a regular term of said Court begun and held at the City of Toledo, in said District, on the last Tuesday in April, being the 30th day of said month in the year of Our Lord One Thousand Nine Hundred and Thirty-five, and of the Independence of the United States the One Hundred and Fifty-ninth, to-wit; on Saturday, the 29th day of June, A. D., 1935.

Present: Honorable George P. Hahn, United States District Judge.

CONSOLIDATED CAUSES

No. 1408 In Equity.

THE TOLEDO PRESSED STEEL COMPANY,

vs.

STANDARD PARTS, INC.

No. 1412 In Equity.

THE TOLEDO PRESSED STEEL COMPANY,

vs.

HUEBNER SUPPLY COMPANY

Said action numbered 1408 In Equity was commenced on the 16th day of January, A. D., 1934, and said action numbered 1412 In Equity was commenced on the

26th day of January, A. D., 1934, and proceeded to final disposition at the term and day above written, and, during the progress thereof, pleadings and papers were filed, process was issued and returned, and orders of the Court were made and entered in the order and on the dates hereinafter stated, to-wit:

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

In Equity No. 1408

THE TOLEDO PRESSED STEEL COMPANY,
Plaintiff,

vs.

STANDARD PARTS, INC.,
Defendant.

BILL OF COMPLAINT

(Filed January 16, 1934)

The plaintiff, for its bill of complaint, alleges:

I.

That plaintiff is a corporation duly organized and existing under and by virtue of the laws of the State of Ohio, and is a citizen of Ohio, having its principal place of business at Toledo in said State.

II.

That, as plaintiff is informed and believes, and therefore avers, defendant, Standard Parts, Inc., is a corporation organized and existing under and by virtue

f the laws of the State of Ohio, and is a citizen of Ohio, nd has its office and principal place of business at To-edo in said State.

III.

That this is a suit in equity arising under the pat-nt laws of the United States for infringement of United States Letters Patent No. 1,732,708, issued to plaintiff n October 22nd, 1929.

IV.

That heretofore and before the 26th day of Decem-er, 1928, Joseph E. Withrow and Lyman W. Close, both itizens of the United States, residing at Toledo in the State of Ohio, were the original, first and joint inventors of a certain new and useful Burner, not known or used by others in this country before their invention or dis-covery thereof, and not patented or described in any Let-ters Patent or printed publication in this or any foreign country before their invention or discovery thereof or more than two years prior to their application for the hereinafter mentioned Letters Patent, and not in public use or on sale in this country for more than two years prior to the date of their said application for Letters Patent in the United States, and not patented in any for-eign country upon an application filed more than twelve months prior to their said application for Letters Pat-ent, and not abandoned to the public.

V.

That on or about December 26th, 1928, the said Joseph E. Withrow and Lyman W. Close, being as afore-said the original, first and joint inventors of said burner, made due application to the Commissioner of Patents of the United States for Letters Patent of the United States for said invention, and by an instrument in writ-ing, duly executed and delivered by them, assigned and transferred the entire right, title and interest in and to said invention and Letters Patent to plaintiff herein, The Toledo Pressed Steel Company, and authorized and requested the Commissioner of Patents to issue the Let-ters Patent for said invention to said assignee, and hav-ing in all respects duly complied with the conditions and requisitions of the Acts of Congress in such cases made and provided, on the 22nd day of October, 1929, Letters Patent of the United States for said invention, bearing

No. 1,732,708, signed, sealed and executed in due form of law, were issued and delivered over to plaintiff, as the assignee of said Joseph E. Withrow and Lyman W. Close, whereby there was secured unto plaintiff and its successors and assigns for the term of seventeen (17) years from said 22nd day of October, 1929, the sole and exclusive right of making, using, selling and granting to others the right to make, use and sell, said burners, or as by said Letters Patent, or a duly authenticated copy thereof, herein court produced and shown unto your Honors, will more fully and at large appear, a copy of said Letters Patent being attached hereto, and marked "Plaintiff's Exhibit A", and forming a part hereof.

VI.

That plaintiff, is now and has been continuously since the issuance of said Letters Patent No. 1,732,708, the owner thereof.

VII.

That plaintiff further states that the invention as aforesaid is of great utility and value; that burners made in accordance with the invention of said Letters Patent, have been sold by it in very large and constantly increasing quantities; that the invention covered by said Letters Patent is of great importance and value to it; that Plaintiff has expended large sums of money for advertising burners made in accordance with the invention of said Letters Patent; and that Plaintiff has been and now is ready to supply the trade and public with burners made by and in accordance with the invention of said Letters Patent.

VIII.

That plaintiff further states that the public has generally acquiesced in the usefulness of said improvement and has generally acknowledged and acquiesced in the rights of plaintiff with respect to said invention, and in the validity of said Letters Patent.

IX.

That upon information and belief, prior to the commencement of this suit and since the granting of said Letters Patent, the defendant herein named, well knowing the facts as herein set forth, has wilfully infringed said Letters Patent against the will of plaintiff and in

violation of plaintiff's rights; has been and is now infringing said Letters Patent within the Northern District of Ohio by using and selling, and causing to be used or sold within the Northern District of Ohio and elsewhere in the United States, burners, made in accordance with the invention disclosed, described and claimed in the said Letters Patent and infringement thereof, all against plaintiff's will and without plaintiff's license and consent notwithstanding notice of said Letters Patent being displayed on each burner manufactured and sold or offered for sale by plaintiff; that said defendant is threatening to continue and to increase such acts of infringement; that its infringing acts have the effect of inducing others to infringe said Letters Patent, and that by said infringing acts defendant has wrongfully converted to itself trade and profits which plaintiff would otherwise have received and enjoyed as to the amount of which plaintiff is uninformed and prays discovery, and whereby plaintiff has been caused great and irreparable damage and injury, and defendant will, if it is allowed to continue such infringement, further irreparably damage and injure the plaintiff, depreciate or destroy the value of the exclusive rights to which plaintiff is entitled under said Letters Patent, and deprive the plaintiff of the benefit and advantages thereof.

X.

That plaintiff is informed and believes, and therefore avers, that the said defendant is prepared and ready to continue such infringement; and unless it is restrained from so doing, plaintiff will suffer irreparable injury, for the loss of which there is no adequate remedy at law.

Wherefore, plainitff prays:

1. That a perpetual injunction may be issued enjoining and restraining said defendant, its officers, agents, attorneys, servants, workmen and employees, and each of them, and all those in privity therewith, from in any way infringing directly or indirectly, or contributing to the infringement of said Letters Patent or any of the claims thereof.

2. That defendant be ordered and decreed to deliver to plaintiff each and all of the infringing burners or parts thereof which it has in its possession or under its control, or that the same may be destroyed, or that they may be delivered into court, or be impounded by

the court for such final disposition as to the court may seem just or proper.

3. That defendant be required to account for and pay over to plaintiff such gains and profits as have accrued or arisen or been earned or received by the said defendant, and of such gains and profits as would have accrued to plaintiff but for the unlawful doings of said defendant and all damages plaintiff has sustained thereby, and that the court will assess the same or cause them to be assessed under its direction and will increase the same in its discretion as provided by law.

4. That defendant be required to answer this bill of complaint, but not under oath, answer under oath being hereby expressly waived.

5. That defendant may be decreed to pay the costs, charges and disbursements in this suit and that plaintiff may have such other and further relief as the circumstances and equity of the case may require.

The Toledo Pressed Steel Company
By Joseph E. Withrow,
President

(Seal)

Owen & Owen,
Solicitors and Counsel for Plaintiff.

Verification

State of Ohio, County of Lucas, ss.

On this 13th day of January, 1934, before me personally appeared Joseph E. Withrow, who being by me first duly sworn, deposes and says that he is President of The Toledo Pressed Steel Company, the plaintiff hererin; that he has read the foregoing bill of complaint by him subscribed, and knows the contents thereof, and that the same is true to his own knowledge except as to matters therein stated to be alleged on information and belief, and as to these matters, he believes it to be true.

Mary E. Dukes,
Notary Public.

(Notarial Seal)

Plaintiff's Exhibit "A" attached to Bill of Complaint, Patent No. 1,732,708, Joseph E. Withrow and Lyman W. Close, October 22, 1929, (Assignors to The Toledo Pressed Steel Co. Burner). See Plaintiff's Exhibit No. 1, "File Wrapper No. 1,732,708, Withrow."

ANSWER

(Filed February 15, 1934)

Equity No. 1408.

Comes now the above-named defendant and for its answer to the Bill of Complaint herein, respectfully states:

Paragraphs Nos. 1 to 10 hereof refer to and are answers to Paragraphs I to X of the Bill of Complaint.

1. Defendant has no knowledge of the corporate organization of plaintiff, and therefore denies the allegations of Paragraph I of the Bill, and asks that the plaintiff be put upon strict proof thereof.

2. Defendant admits the allegations of Paragraph II of the Bill.

3. Defendant admits the alllegations of Paragraph III of the Bill.

4. Defendant denies the allegations of Paragraph IV of the Bill, and particularly denies that the alleged inventors were the first or the joint inventors of the burner involved in this case, and avers that said burner was known and used by others in this country before their alleged invention or discovery thereof, and was patented and described in Letters Patent and in printed publications in this and in foreign countries before their alleged invention or discovery thereof, and more than two years prior to their application referred to, and avers that said burner was in public use and on sale in this country more than two years prior to their said application. As to whether said device was patented in foreign countries and when, the defendant is not informed, and denies the allegations concerning foreign patenting and foreign applications.

Defendant avers that said alleged invention was abandoned by the applicants to the public.

5. Defendant admits the making of the application as alleged in Paragraph V of the Bill, and admits the issue of Patent No. 1,732,708 to the plaintiff, but denies that the plaintiff by reason of said issue secured any right to make, use or sell or to grant to others the right to make, use or sell said burners.

6. Defendant denies the allegation of Paragraph VI of the Bill.

7. Defendant denies that the alleged invention is of any utility or value, that plaintiff has sold burners made

in accordance therewith, that the alleged invention is of great importance and value to plaintiff, that plaintiff has expended large sums of money for advertising said burners, and that plaintiff is now ready to supply the trade with the burners.

8. Defendant denies that the public has acquiesced in the usefulness of the alleged invention and has particularly acknowledged and acquiesced in the plaintiff's rights with respect thereto or in the validity of said patent.

9. Defendant denies that it has infringed willfully or otherwise upon any rights of the plaintiff represented by the patent in suit or otherwise or that it is now infringing thereon.

Defendendant further denies that the plaintiff has placed proper notice of said patent on the burners made and sold or offered for sale by it.

Defendant denies that it continues or threatens to continue any act of infringement and denies that any acts of infringement and denies that any acts of it have the effect of inducing others to infringe.

Defendant further denies that it has wrongfully converted to itself any trade or profits, which plaintiff would otherwise have received or enjoyed, and denies that defendant has caused any damage or injury to the plaintiff or is about to continue any acts which will injure or damage the plaintiff or affect any value of any rights plaintiff is entitled to under said patent or deprive the plaintiff of any benefit or advantage thereof.

10. Defendant denies that it is prepared and ready to continue any infringement on any right of plaintiff.

11. Defendant avers that said Letters Patent in suit are invalid and void and do not involve invention or patentable subject matter, because in view of the common public knowledge disclosed by the state of the art prior to the alleged invertion by plaintiff's patentees, it did not require or involve invention to produce the device covered by plaintiff's patent, but that on the contrary the production of such device involved merely mechanical skill and such ordinary anticipation and utilization of well known parts as was within the common knowledge and ability of any person possessing the ordinary average skill and knowledge in the burner industry.

12. Defendant further avers that the Letters Patent in suit are invalid and void as not involving inven

tion or patentable subject matter in view of the art existing prior to the date of the alleged invention by plaintiff's patentees, that it required no invention to produce the device of the patent in suit, and that said device did not differ in any patentable respect from what was known and used in this country by the patentees of the following patents and from what was patented and described in said patents:

UNITED STATES LETTERS PATENT

Jones and Collins	No.	56,949	August	7, 1866
Heath	No.	66,021	June	25, 1867
Dyott	No.	116,573	July	4, 1871
Baldwin	No.	120,613	November	7, 1871
Hathaway	No.	147,496	February	17, 1874
Billingham	No.	181,030	August	15, 1876
Beckie	No.	192,130	June	19, 1877
Heston	No.	270,587	January	16, 1883
Blake	No.	453,335	June	2, 1891
Warner	No.	826,297	July	17, 1906
Katz and Luethe	No.	1,009,184	November	21, 1911
Kahn	No.	1,175,527	March	14, 1916

and others now to the defendant unknown, which defendant respectfully prays right to plead when known.

That the only patents cited by the Patent Office or mentioned by it or by Withrow and Close during the prosecution in the Patent Office of the application for the patent in suit were:

UNITED STATES LETTERS PATENT

Hathaway	No.	147,496	February	17, 1874
Lilley	No.	716,845	December	23, 1902
Lucas	No.	1,433,632	October	31, 1922
Greene	No.	20,153	May	4, 1858
Jacobs	No.	83,171	October	20, 1868
White	No.	106,753	August	23, 1870
Sawyer	No.	187,915	February	27, 1877
Coulter	No.	925,563	June	22, 1909
Dyett	No.	116,573	July	4, 1871
Elton et al	No.	599,525	February	22, 1898
Conklin	No.	536,603	April	2, 1895
Patterson	No.	57[illegible],903	January	26, 1897
Bentote	No.	753,952	March	8, 1904
Sickel	No.	6,624	August	7, 1849
Wales	No.	22,465	December	28, 1858

Moore	No.	105,589	July	19, 1870
Rosencrantz	No.	22,536	January	4, 1859
Lecomte	No.	703,662	July	1, 1902
Sheldon	No.	254,711	March	7, 1882
Follett	No.	241,344	May	10, 1881
Heath	No.	1,038,882	September	17, 1912
Spear	No.	840,025	January	1, 1907

and the following foreign patents

German patent No. 87,781 to Schulke
British patent No. 164,865
Norwegian patent No. 4,551
Swedish patent No. 30,359
Swedish patent No. 36,818

13. That the use of exposed flame burners or flares as signals on highways and railroads and construction jobs is very old and has been practiced for example more than two years prior to the application for the patent in suit by the

Chicago, Rock Island and Pacific Railway Company
Chicago, Burlington & Quincy Railroad Company
Chicago Great Western Railroad Company
Chicago, Milwaukee, St. Paul & Pacific Railroad Co.
Chicago and Northwestern Railroad Company
Pennsylvania Railroad Company
Baltimore and Ohio Railroad Company

and their respective predecessors.

Wherefore, defendant prays that this cause be dismissed at plaintiff's costs.

Standard Parts, Inc.,
By Bair, Freeman & Sinclair,
Its Attorneys

W. P. Bair,
Of Counsel.

PLAINTIFF'S INTERROGATORIES

(Filed March 8, 1934)

Now comes the plaintiff, and, pursuant to Equity Rule 58, propounds the following interrogatories to be answered under oath by the President or other duly qualified officer of defendant having knowledge of the matters inquired about in the interrogatories:

1. Which of the numerous prior art patents referred to in paragraph 12 of the Answer will be relied on

(a) for anticipation of the patent in suit, and

(b) for showing want of invention in the patent in suit?

2. Furnish drawings or other illustrations of each of the exposed flame burners or flares referred to in paragraph 13 of the Answer and of which defendant intends to make any use at the hearing of this cause, such drawings or illustrations to show the burner construction of such devices and to identify the respective use and date of use thereof.

3. Did the defendant, subsequent to October 22, 1929, and prior to the filling of the bill of complaint herein, use and/or sell within the Northern District of Ohio, Western Division, burners or torches like those shown in the illustration attached hereto as Exhibit B?

4. When did defendant first commence the sale or handling of burners or torches like those shown in Exhibit B?

5. From whom does or did defendant obtain its torches like those shown in Exhibit B attached hereto?

6. State if this suit is being defended by defendant at its own expense, and if not, by whom.

Respectfully submitted,

Owen & Owen,

Attorneys for Plaintiff.

Toledo, Ohio, March 8th, 1934.

NOTE—Exhibit B is reproduced at page 153, infra.

ANSWER TO INTERROGATORIES

(Filed September 15, 1934)

Comes now the defendant, Standard Parts, Inc., and by way of answer to the Interrogatories of the plaintiff heretofore filed herein, and in accordance with the letter heretofore written Owen & Owen, attorneys for plaintiff on April 18, 1934, the answers are as follows:

1. (a)

CLAIM 1

Billingham	181,030	
Reekie	192,130	
Dyott	116,573	

and also

Almond	193,796	August 7, 1877

and

Flora	755,864	March 29, 1904

CLAIM 2

Same as Claim 1.

CLAIM 5

Same as Claim 1.

CLAIM 7

Same as Claim 1, except Dyott.

CLAIM 12

Same as Claim 7.

CLAIM 13

Same as Claim 7.

1. (b)

All the patents mentioned in the Answer and the additional ones to

Almond, No. 193,796, August 7, 1877, and

Flora, No. 755,864, March 29, 1904

2. Defendant is not in position at the present time to furnish the drawings requested, but will furnish drawings of any exposed flameburners or flares referred to at the trial as constituting anticipation, at least twenty days in advance of the trial in accordance with U. S. Code, Title 35, Section 69.

3. Yes.
4. About the last of October, 1933.
5. The Bolser Corporation.
6. This suit is being defended by defendant by counsel employed at the expense of The Bolser Corporation to defend the suit on behalf of defendant.

Standard Parts, Inc.,
By Halloway, Peppers & Romanoff,
Its Attorneys
and by Bair, Freeman & Sinclair,
Its Attorneys

W. P. Bair,
Of Counsel.

Service of the above Answer to Interrogatories and receipt of copy thereof acknowledged this 14th day of September, 1934.

Owen & Owen,
Attorneys for Plaintiff.

FURTHER ANSWER TO PLAINTIFF'S INTERROGATORIES

(Filed April 11, 1935)

Comes now the defendant, Standard Parts, Inc., and notes that Claim 11 was inadvertently omitted from the Answer 1-(a) in the Answers to the Interrogatories heretofore filed.

Plaintiff's Counsel were notified by letter on April 18, 1934, that defendant would rely upon the same patents as anticipating Claim 11 that were relied upon as against Claim 1.

Defendant therefore amends its answer to the Interrogatories by stating

> "Defendant will rely on the same patents as anticipating Claim 11 as are relied upon as against Claim 1, except Dyott."

Respectfully,

Standard Parts, Inc.,
By Bair, Freeman & Sinclair,
Halloway, Peppers & Romanoff,
Its Attorneys

W. P. Bair,
Of Counsel.

Service of the above Further Answer to Plaintiff's Interrogatories, and receipt of copy thereof, acknowledged this 9th day of April, 1935.

Owen & Owen,
Attorneys for Plaintiff.

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION
In Equity No. 1412

THE TOLEDO PRESSED STEEL COMPANY,
Plaintiff,

vs.

HUEBNER SUPPLY COMPANY,
Defendant.

BILL OF COMPLAINT

(Filed January 26, 193)

The plaintiff, for its bill of complaint, alleges:

II.

That, as plaintiff is informed and believes, and therefore avers, defendant, Huebner Supply Company, is a corporation organized and existing under and by virtue of the laws of the State of Ohio, and is a citizen of Ohio, and has its office and principal place of business at Toledo, in said State.

- - - "Paragraphs I, III, IV, V, VI, VII, VIII, IX and X, and the prayer in this case are exactly the same as the corresponding paragraphs and prayer in the Bill of Complaint in Equity No. 1408." - - -

The Toledo Pressed Steel Company
By Joseph E. Withrow,
President.

(Seal)

Owen & Owen,
Solicitors and Counsel for Plaintiff.

VERIFICATION

State of Ohio, County of Lucas, ss.

On this 24th day of January, 1934, before me personally appeared Joseph E. Withrow, who being by me first duly sworn, deposes and says that he is President of The Toledo Pressed Steel Company, the plaintiff herein; that he has read the foregoing bill of complaint by him subscribed, and knows the contents thereof, and that the same is true to his own knowledge except as to matters therein stated to be alleged on information and belief, and as to these matters, he believes it to be true.

Mary E. Dukes,
(Notarial Seal) Notary Public.

Plaintiff's Exhibit "A" attached to Bill of Complaint, Patent No. 1,732,708, Joseph E. Withrow and Lyman W. Close, October 22, 1929, (Assignors to The Toledo Pressed Steel Co. Burner). See Plaintiff's Ex-

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

In Equity No. 1412.

THE TOLEDO PRESSED STEEL COMPANY,

Plaintiff,

vs.

HUEBNER SUPPLY COMPANY,

Defendant.

ANSWER

(Filed February 26, 1934)

Comes now the above-named defendant, and for answer to the Bill of Complaint herein respectfully states:

– – – "Paragraphs I to 13 of the Answer in Equity No. 1412, are exactly the same as the corresponding Paragraphs of the Answer in Equity No. 1408." – – –

Huebner Supply Company,
Defendant,

By Holloway, Peppers & Romanoff,
and Bair, Freeman & Sinclair,
Its Attorneys

W. P. Bair,
Of Counsel.

Des Moines, Iowa, February 22, 1934.

Service of the foregoing Answer, and receipt of copy thereof acknowledged this 26th day of February, 1934.

Owen & Owen,
Attorneys for Plaintiff.

PLAINTIFF'S INTERROGATORIES

(Filed March 9, 1934)

Now comes the plaintiff, and, pursuant to Equity Rule 58, propounds the following interrogatories to be answered under oath by the President or other duly qualified officer of defendant having knowledge of the matters inquired about in the interrogatories:

1. Which of the numerous prior art patents referred to in paragraph 12 of the Answer will be relied on

(a) for anticipation of the patent in suit, and

(b) for showing want of invention in the patent in suit?

2. Furnish drawings or other illustrations of each of the exposed flame burners or flares referred to in paragraph 13 of the Answer and of which defendant intends to make any use at the hearing of this cause, such drawings or illustrations to show the burner construction of such devices and to identify the respective use and date of use thereof.

3. Did the defendant, subsequent to October 22, 1929, and prior to the filing of the bill of complaint herein, use and/or sell within the Northern District of Ohio, Western Division, burners or torches like those shown in the circular attached hereto as Exhibit B?

4. When did defendant first commence the sale or handling of burners or torchers like those shown in Exhibit B?

5. From whom does or did defendant obtain its torches like those shown in Exhibit B attached hereto?

6. State if this suit is being defended by defendant at its own expense, and if not, by whom.

Respectfully submitted,

Owen & Owen,
Attorneys for Plaintiff.

Toledo, Ohio, March 8th, 1934.

NOTE.—Exhibit B is reproduced at page 154, infra.

ANSWER TO INTERROGATORIES

(Filed September 15, 1934)

(September 15, 1934—Leave to file granted—
Geo. P. Hahn, D. J.)

Comes now the defendant, Huebner Supply Company, and in answer to the Interrogatories of the plaintiff heretofore filed, states as follows the answers to the Interrogatories—

1. (a)

CLAIM 1

Billingham	181,030	
Reekie	192,130	
Dyott	116,573	

and also

Almond	193,796	August 7, 1877

and

Flora	755,864	March 29, 1904

CLAIM 2

Same as Claim 1.

CLAIM 5

Same as Claim 1.

CLAIM 7

Same as Claim, except Dyott.

CLAIM 12

Same as Claim 7.

CLAIM 13

Same as Claim 7.

1. (b)

All the patents mentioned in the Answer and the additional ones to

Almond	No. 193,796	August 7, 1877

and

Flora	No. 755,864	March 29, 1904

2. Defendant is not in position at the present time to furnish the drawings requested, but will furnish drawings of any exposed flame burners or flares referred to

at the trial as constituting anticipations, at least twenty days in advance of the trial in accordance with U. S. Code, Title 35, Section 69.

3. Yes.

4. Early part of December, 1933

5. Kari-Keen Manufacturing Co.

6. This suit is being defended by defendant by counsel employed at the expense of the Kari-Keen Manufacturing Co. to defend the suit on behalf of defendant.

Huebner Supply Company,
By Holloway, Peppers & Romanoff,
and by Bair, Freeman & Sinclair,
Its Attorneys

W. P. Bair,
Of Counsel.

Service of the above Answer to Interrogatories and receipt of copy thereof acknowledged this 14th day of September, 1934.

Owen & Owen,
Attorneys for Plaintiff.

FURTHER ANSWER TO PLAINTIFF'S INTERROGATORIES

(Filed April 11, 1935)

Comes now the defendant and amends its Answer to Interrogatories heretofore filed herein.

It is noted that in the Answer heretofore filed, part 1-(a), reference to Claims 6 and 11 were omitted.

Defendant therefore amends its Answer to said Interrogatories by adding thereto—

CLAIM 6

Plaintiff relies upon the same patents relied upon to anticipate Clam 1.

CLAIM 11

Plaintiff relies upon the same patents to anticipate that are relied upon as against Claim 1, except Dyott.

Standard Parts, Inc.,
By Bair, Freeman & Sinclair,
Holloway, Peppers & Romanoff,
Its Attorneys

W. P. Bair,
Of Counsel.

Service of the above Further Answer to Plaintiff's Interrogatories, and receipt of copy thereof, acknowledged this 9th day of April, 1935.

Owen & Owen,
Attorneys for Plaintiff.

IN THE

DISTRICT COURT OF THE UNITED STATES

FOR THE NORTHERN DISTRICT OF OHIO,

WESTERN DIVISION.

Equity No. 1408.

THE TOLEDO PRESSED STEEL COMPANY,

Plaintiff,

vs.

STANDARD PARTS, INC.,

Defendant.

Equity No. 1412.

THE TOLEDO PRESSED STEEL COMPANY,

Plaintiff,

vs.

HUBNER SUPPLY COMPANY,

Defendant.

MEMORANDUM OPINION

(Filed June 3, 1935)

HAHN, *J.*:

This is an action for the alleged infringement of Patent No. 1,732,708, issued to Withrow and Close on October 22, 1929. The defendants are sellers of the products of manufacturers. Case No. 1408 involves the Bolser Flares manufactured by the Bolser Corporation, Des Moines, Iowa, and the suit is being defended by that company. See Exhibit 3-B. Case No. 1412 involves the K-K Truck Flares, manufactured by the Kari-Keene Manufacturing Company, formerly Meyers-Wilson Manufacturing Company, Sioux City, Iowa, and the suit is being defended by that company. See Exhibit 3-C. The defense is lack of novelty and invention, and infringement is denied.

The patent covers a torch burner or flare of the type usually used as a warning signal upon repair work.(1) Latterly, as required by the laws of several of the states, this type of warning signal is also used upon trucks parked upon the highway.

(1) See: McCloskey v. Toledo Pressed Steel Co., (C. C. A. 6) 71 F. (2d) 12, 13.

Formerly red lanters were used almost exclusively as such warning signals. These proved unsatisfactory because red lanterns resembled to some extent the red tail lights of automobiles, and they were often stolen. The flares first used were of the open type resembling Exhibits 28 and 29. While this type was more satisfactory than the use of lanterns, many complaints were made against the open flame flares because they would not withstand winds and rains. The patentees, who are very familiar with this art, experimented over a wide period of time and tested out many devices. From memory they have made drawings representing the various experimental types which led up to the patent in suit. These drawings are Exhibits 10-A to 10-J. They are arranged in chronological order.

When plaintiff's device came upon the market, McCloskey, who appears to have been a pioneer manufacturer of open flame torches, adopted a closed flame type of torch. The oldest and largest manufacturer of red lanterns, Dietz & Company, brought out an open flame torch about the time that plaintiff's torch was placed on the market. Thereafter Dietz brought out a protected flame torch with an open top and later a hooded torch with closed top and sides except for air inlet and flame outlet openings. The manufacturers of the alleged infringing torches came upon the market several years after the issuance of the patent in suit, and immediately reduced materially the volume of plaintiff's business. Three manufacturers of torches have recognized the validity of plaintiff's patent by taking licenses thereunder.

The plaintiff's devices have overcome the objections urged to the open flame torches, have met the tests suggested by the highway departments of the states which require the use of warning signals, and these torches have further materially effected economies by reducing the fuel costs about one-half and by greatly reducing the wick consumption. The inventive step involved is readily observable by contrasting Exhibits 28 and 29, which represent plaintiff's former commercial devices, and Plaintiff's Exhibit 3-A, which represents devices manufactured in accordance with the patent in suit.

While the change means a simple one, (2) it was far from obvious. Although plaintiff's products have been on the market for over five years, no other further improvement has been made in the device. The changes that have been made have perhaps been made merely for the purpose of escaping infringement.

In my opinion the improvement of the patent in suit responds in many ways to the tests of invention. The art called for the improvement; it was met by plaintiff's device. United Shoe etc. Corp. v. E. H. Feere Co., 64 F. (2d) 101, 102, 103. As we have seen, the plaintiff's device has met the test suggested by the various highway departments and the public generally has acquiesced in the use of plaintiff's device. National v. Richardson, (C. C. A. 6) 53 F. (2d) 282, 292. Naivette v. Bishinger, (C. C. A. 6) 61 F. (2d) 433, 435, 436. Eibel Co. v. Paper Co., 261 U. S. 45, 46. Present complaints are readily explainable upon the basis of a misuse of the present devices. As we have seen, three licenses have been taken under the patent. Elliott & Co. v. Youngstown Car Mfg. Co., (C. C. A. 3) 188 Fed. 345 (4). 48 C. J. 95, note 88. There has been persistent imitation, if not infringement, of plaintiff's device. Linville v. Milberger, 29 F. (2d) 610 (5). 48 C. J. 96, S. 96. The fact that there has been no improvement in the period of about five years since the patent issued and that plaintiff's device displaced practically all others is weighty evidence that the patentees of the patent in suit took an inventive step. Computing v. Automatic, 240 U. S. 609, 616. Plaintiff's device seems to have afforded the ultimate solution of the problem involved. Warren v. Kholes, 163 Fed. 263, 280 (C. C. A. 1).

From a consideration of all the evidence, I think plaintiff's contribution to the art represents more than mere mechanical skill and has the merit of invention. If there were doubt upon this subject, I feel that the commercial success of plaintiff's device would turn the scale in favor of invention. Goodbody v. Firestone, (C. C. A. 6) 23 F. (2d) 625 (4).

In urging validity and the limiting of the claims, defendants argue that their best reference is Almond No. 193,796. This patent is for a "Vapor Burner for Heat-

(2) Star v. General, 111 Fed. 398, 400 (C. C. A. 6); Potts v. Creager, 155 U. S. 597, 608; Loom Co. v. Higgins, 105 U. S. 591; H. G. White Co. v. Norton N. Converse & Sons Co., 20 F. (2d) 311, 313.

ing Purposes." It was not even intended that it should be used for illuminating purposes. For its intended purpose it would produce a blue flame and not a luminescent flame which is necessary for lighting purposes. The testimony shows that Almond's structure would not burn even in a moderate wind. The specifications, it seemed to me, would afford no suggestion of Withrow and Close's device to a mechanic skilled in the art. The drawings of the patent are very involved and complicated, and in my opinion would not suggest plaintiff's device except through the medium of hindsight and through the eyes of the patentees in suit. (3)

Defendants' expert testified that Martine No. 35,340 is equally pertinent with Almond as a reference from the standpoint of patentability. Martine's problem was to prevent smoking in a laboratory lamp. His contribution was the attaching to the lamp of a tube of sheet metal or other suitable material of somewhat greater diameter than the wick tube or the orifice of the laboratory lamp. It has less merit as an anticipation than has Almond. Other references relied on are Wenzel No. 577,090, Blake No. 453,385, Kahn No. 1,755,527, Heston No. 270,587 and Hathaway No. 147,496. Wenzel's patent covered a safety lamp also used as a night lamp. For use for the latter purpose the light was covered or protected by a glass shield with an open top. Blake is for a hydrocarbon illuminating burner "adapted for use with the lighter and more volatile oils—such as naphta or gasoline—which vaporize at moderate heat." (p. 1, lines 24-26)

Plaintiff's expert would combine Wenzell, Exhibit D, with Blake or Kahn or Heston, to anticipate the device of the patent in suit. Hathaway is for the improvement of a burner as such. Hathaway's burner could not be used as a light, much less as an exposed warning signal. I do not further discuss these various references; I do not think that alone or in combination with other references they anticipate the device of the patent in suit. The evidence shows that the patentees Withrow and Close experimented with many devices which appear

(3) "The eye that sees a thing already embodied in mechanical form gives little credit to the eye that first saw it in imagination. But the difference is just the difference between what is common observation and what constitutes an act of creation. The one is the eye of inventive genius; the other of a looker on after the fact." Faries Mfg. Co. v. George W. Brown & Co., (C. C. A. 7) 121 F. 547, 550.

Exhibits 10-A to 10-J, inclusive. From their testimony, I find it to be the fact that the devices described in these exhibits were unsatisfactory and did not solve the problem which is solved by the patent in suit. These facts being established, I readily reach the conclusion that the devices of the cited references would likewise fail in solving that problem or to suggest its solution to the mechanic skilled in the art.

Viewing them in the light of the applicable law, this must be true. Some of the authorities are as follows:

Skelly Oil Co. v. Universal Oil Products Co., (C. C. A. 3) 31 F. (2d) 427, 431:

"A patent relied upon as an anticipation must itself speak. Its specification must give in substance the same knowledge and the same directions as the specification of the patent in suit. Otto v. Linford, 46 L. T. (N. S.) 35, 44. It is not enough to prove that a method or apparatus described in an earlier specification can be made to produce this or that result. Flour Oxidizing Co. v. Carr & Co., 35 R. P. C. 457. A singularly sensible test of the rule of anticipation is given in British Thomson-Houston Co. v. Metropolitan Vickers Electrical Co., 45 R. P. C. 22, by asking the question—'Would a man who was grappling with the problem solved by the patent attacked, and having no knowledge of that patent, if he had had the alleged anticipation in his hands, have said: "That gives me what I wish!" ' The Pope Alliance Corporation v. The Spanish River Pulp & Paper Mills, Ltd. (Privy Council Appeals No. 33 of 1928.)"

Fulton Co. v. Bishop & Babcock Co., 17 F. (2d) 999, 1002; (Westenhaver, J.):

"This art, and all that can be claimed for it, is not adequate to show anticipation or to deprive Fulton's means, considered merely as a mechanism, of the quality of invention. This results from settled rules for appraising the prior art, established by numerous decisions. Prior patents are part of the prior art only by what they disclose on their face. Prior accidental production of the same thing, where the character and function are not recognized until the later patent, does not effect anticipation. Anticipation is not disclosed by

drawings which only show a similar arrangement of parts, where such arrangement is not essential to the first invention and was not adopted and used to perform the function which it performs in the second invention, especially when the first patent contains no suggestion of the way in which the result sought is accomplished by the second inventor, Fulton Co. v. Bishop & Babcock Co., (C. C. A. 6) 284 F. 774, 777, and cases cited."

Gordon Form Lathe Co. v. Walcott Mach. Co., (C. C. A. 6) 32 F. (2d) 55, 58:

"In none of the patents cited is any effort shown to devise, or disclosure made of, means for oscillating the tool, in synchronism with its reciprocatory movements and the revolution of the work, by the use of an appropriately shaped cam, movable frame and bell crank lever tool support. None contemplates the turning of irregular or non-geometric forms. Those patents cannot be considered as anticipations which do not disclose the purpose, means, and mechanisms for accomplishing the end of the patent in suit, and which are restricted, by the mechanisms disclosed, to the accomplishment only of a substantially different and limited purpose. Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U. S. 45, 66, 43 S. Ct. 322 (67 L. Ed. 523); Canada et al vs. Michigan M. Iron Co., 124 F. 486, 493 (C. C. A. 6); Munsing Paper Co. v. American Sulphite Pulp Co., 228 F. 700, 703 (C. C. A. 6); Hobbs et al v. Beach, 180 U. S. 383, 392, 21 S. Ct. 409 (45 L. Ed. 586); Fulton Co. v. Bishop & Babcock Co., 284 F. 774, 777 (C. C. A. 6); C. Outlook Envelope Co. v. General Paper Goods Mfg. Co., 239 F. 877 (C. C. A. 2). It is true that the mechanism of the Brophy patent can be so reorganized as to cut a cam or other nongeometric figure, but this is done only by substituting for the eccentrics of Brophy the more or less arbitrarily shaped and specially designed separate control cams of the patent in suit. Such reorganization constitutes incorporating into the machine of Brophy the essence of the Gordon invention to accomplish the Gordon result. Such an organiza

tion was neither conceived nor disclosed by Brophy, and the possibility of reorganization, so as to reveal in the machine of Brophy the actual disclosures of Gordon, will not convert the patent to Brophy into an anticipation. * * * As stated by the District Judge, the reorganization itself 'indicated inventive thought.'"

Frey et al. v. Marvel Auto Supply Co., 236 Fed. 916, 918 (C. C. A. 6):

"Prior patents are part of the prior art only by what they disclose on their face. Naylor v. Alsop Process Co., (C. C. A. 8) 168 Fed. 911, 920, 94 C. C. A. 315; Munsing Paper Co. v. American etc. Co., (C. C. A. 6) 228 Fed. 700, 703, 143 C. C. A. 222. We are satisfied that Swain's air inlets do not have the effect of Frey's non-return valve referred to."

Buckeye Incubator Co. v. Blum, 17 F. (2d) 456, 457 (Westenhaver, J.):

"As to mechanical patents, the law is settled that prior patents are not a part of the prior art, except as to what is disclosed on their face, and that they cannot be reconstructed in the light of the invention in suit, and then used as an anticipation or to repel novelty. This is particularly true, if the prior patents contain no suggestion that they were designed by the maker for the performance of the functions of the patented device, and were in fact never adapted or actually used for that purpose. See Topliff v. Topliff, 145 U. S. 156, 161, 12 S. Ct. 825, 36 L. Ed. 658; Frey v. Marvel Auto Supply Co. (C. C. A. 6) 236 F. 916, 918! Stead Lens Co. v. Kryptok (C. C. A. 8) 214 F. 369, 375."

W. Bingham Co. v. Ware, 46 F. (2d) 33 (C. C. A. 6):

"It is said by counsel for appellant that it was a simple matter to take Brown or some other of the metal rollers, remove the steel tread and reform the side plates for the mounting of a rubber tire, and thus produce Ware. Examining the prior patents in connection with the Ware structure, since it has now been devised, that would seem true, but patentability is not defeated by feasibil-

ity of effecting the same result by the changing of existing structures. Topliff v. Topliff, 145 U. S. 156, 12 S. Ct. 825, 36 L. Ed. 658; and Nelson Mfg. Co. v. Myers & Bro., 25 F. (2d) 659 (C. C. A. 6)."

Further, in view of the express limitations contained in the introductory clauses of the claims of the patent in suit, there may be some doubt as to whether or not the cited references are in analogous arts. Jackson Fence Co. v. Peerless Fence Co., (C. C. A. 6) 228 F. 691; Lakewood v. Walker, 23 F. (2d) 623. I think the defense of want of novelty and invention must fail.

If the patent in suit is valid, I think defendants' devices infringe all of the claims relied upon. Plaintiff's commercial device is represented by Exhibit 3-A and the drawing Exhibit 2-A. The Bolser torch is represented by Exhibit 3-B and the drawing Exhibit 2-B. The K-K torch is represented by Plaintiff's Exhibit 3-C and the drawing Exhibit 2-C. The main argument against infringement, as I gather it, is based upon the manner or method of disposing or mounting the cap upon the torch body. It is said the claims call for the mounting or disposing of the cap directly or immediately upon the torch body.

Defendants' expert testified that Withrow's contribution to the art is his teaching that the cap be mounted or disposed directly or immediately upon the torch body as appears in the exhibits just referred to. I cannot agree with this interpretation of the patent. I think that its main purpose and teaching is to protect the flame at its source and that this idea has been appropriated in defendant's devices. There is authority, too, for saying that where location is one element in a combination, a fair construction of the language of the claims is obtainable only from a study of the entire patent. Deister Concentrator Co. v. Deister Machine Co., (C. C. A. 7) 263 Fed. 706, 709, 710. Such a study shows that the essence of the invention here is protection of the flame at the source, which is accomplished by defendants' devices also. In any event, Exhibit 3-B avoids the language of the claims only by almost imperceptible and immaterial differences. To hold non-infringement on this ground would be clearly to sacrifice substance to form. Plaintiff's Exhibit 3-C is said not to infringe because the cap is mounted not upon the torch body but upon an ex

ension of the wick tube. It seems to me, however, it is st as fair to say that the wick tube in Exhibit 3-B is a art or extension of the torch body, within the meaning f the claims, (although the so-called wick tube is made s a separate part) and that the cap is disposed or ounted upon the torch body within the meaning of the laims fairly construed.

It is said that if defendant's devices come within he language of the claims, they read directly on Almond No. 193,796, and hence that as to this claim the alleged infringing torches are within the prior art. But if the laims read on Almond, they do so as a matter of phraseology only and not as a matter of substance, and defendants do not escape infringement upon the ground urged. The difference between plaintiff's device and the accused devices are arguable differences only; the substance of plaintiff's invention has been appropriated, and the devices infringe all of the claims relied upon.

An appropriate order may be entered in accordance with this memorandum opinion.

Geo. P. Hahn,
District Judge.

Toledo, Ohio, June 3, 1935.

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

In Equity No. 1408.

THE TOLEDO PRESSED STEEL COMPANY,

Plaintiff,

vs.

STANDARD PARTS, INC.,

Defendant.

FINAL DECREE

(Filed and Entered June 29, 1935)

This cause having come on for hearing on the pleadings and proofs and having been argued by counsel for the respective parties both orally and in briefs, and the Court being fully advised in the premises it is

Ordered, Adjudged and Decreed as follows:

1. That Letters Patent in suit No. 1,732,708, for a Burner, issued under date of October 22, 1929, to plaintiff, The Toledo Pressed Steel Company, as assignee of Joseph E. Withrow and Lyman W. Close, are good and valid in law.

2. That the plaintiff is the owner of said Letters Patent and of all rights thereunder and has been such at all times since the grant thereof.

3. That the defendant, Standard Parts, Inc., has infringed upon claims 2, 5, 11, 12 and 13 of said Letters Patent by the sale within the district since the issuance of said Letters Patent of devices manufactured by The Boiser Corporation, of Des Moines, Iowa, illustrated in Plaintiff's Exhibit 2-b and embodied in Plaintiff's Exhibit 3-b herein.

4. That said The Bolser Corporation openly appeared and assumed the defense of this cause and is the real party in interest herein.

5. That a permanent injunction issue out of and under the seal of this court enjoining and restraining the defendant, Standard Parts, Inc., its agents, attorneys, workmen, and employees and all others in privity with said defendant, from infringing upon said Letters patent, or upon any claim thereof, and from inducing others to make, use or sell devices infringing the claims of said

Letters Patent or any of them, without the license of the plaintiff, in any way whatsoever within the territory covered by said Letters Patent.

6. That the plaintiff is entitled to recover from said defendant, Standard Parts, Inc., the profits which it has made from its infringements and the damages which the plaintiff has sustained by reason thereof; but, it appearing that plaintiff has waived its claims for profits and damages against the defendant, Standard Parts, Inc., no order for accounting is made herein, reserving to plaintiff all rights to injunction and accounting against said The Bolser Corporation on account of its sales of said infringing devices to the defendant, Standard Parts, Inc., and/or on account of any and all other infringements of said Letters Patent committed by said The Bolser Corporation.

7. That service of the injunction herein upon defendant's solicitor, Wayne Peppers, Esq., for the defendant, Standard Parts, Inc. shall be as good service as if served personally upon said defendant, Standard Parts, Inc.

8. That plaintiff recover its costs from defendant, Standard Parts, Inc.

Geo. P. Hahn,
United States District Judge.

Dated:.....

Assented to as to form:

Owen & Owen,
Solicitors for Plaintiff.

Bair, Freeman & Sinclair,
Holloway, Peppers & Romanoff,
Solicitors for Defendant.

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

In Equity No. 1412.

THE TOLEDO PRESSED STEEL COMPANY,

Plaintiff,

vs.

HUEBNER SUPPLY COMPANY,

Defendant.

FINAL DECREE

(Filed and Entered June 29, 1935)

This cause having come on for hearing on the pleadings and proofs and having been argued by counsel for the respective parties both orally and in briefs, and the Court being fully advised in the premises it is

Ordered, Adjudged and Decreed as follows:

1. That Letters Patent in suit No. 1,732,708, for a Burner, issued under date of October 22, 1929, to plaintiff, The Toledo Pressed Steel Company, as assignee of Joseph E. Withrow and Lyman W. Close, are good and valid in law.

2. That the plaintiff is the owner of said Letters Patent and of all rights thereunder and has been such at all times since the grant thereof.

3. That the defendant, Huebner Supply Company, has infringed upon claims 1, 2, 5, 6, 7, 11, 12 and 13 of said Letters Patent by the sale within this district since the issuance of said Letters Patent of devices manufactured by Kari-Keen Manufacturing Company, formerly Myers-Wilson Manufacturing Company, of Sioux City, Iowa, illustrated in Plaintiff's Exhibit 2-c and embodied in Plaintiff's Exhibit 3-c herein.

4. That said Kari-Keen Manufacturing Company openly appeared and assumed the defense of this cause and is the real party in interest herein.

5. That a permanent injunction issue out of and under the seal of this court enjoining and restraining the defendant, Huebner Supply Company, its agents, attorneys, workmen, and employees and all others in privity with said defendant, from infringing upon said Letters Patent, or upon any claim thereof, and from inducing others to make, use or sell devices infringing the

claim of said Letters Patent or any of them, without the license of the plaintiff, in any way whatsoever within the territory covered by said Letters Patent.

6. That the plaintiff is entitled to recover from said defendant, Huebner Supply Company, the profits which it has made from its infringements and the damages which the plaintiff has sustained by reason thereof; but, it appearing that plaintiff has waived its claims for profits and damages against the defendant, Huebner Supply Company, no order for accounting is made herein, reserving to plaintiff all rights to injunction and accounting against said Kari-Keen Manufacturing Company and its predecessor Myers-Wilson Manufacturing Company, on account of its or their sales of said infringing devices to the defendant, Huebner Supply Company, and/or on account of any and all other infringements of said Letters Patent committed by said Kari-Keen Manufacturing Company and/or Myers-Wilson Manufacturing Company.

7. That service of the injunction herein upon defendant's solicitor, Wayne Peppers, Esq., for the defendant, Huebner Supply Company, shall be as good service as if served personally upon said defendant, Huebner Supply Company.

8. That plaintiff recover its costs from defendant, Huebner Supply Company.

Geo. P. Hahn,
United States District Judge.

Dated:.....

Assented to as to form:

Owen & Owen,
Solicitors for Plaintiff.

Bair, Freeman & Sinclair,
Holloway, Peppers & Romanoff,
Solicitors for Defendant.

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF OHIO,
WESTERN DIVISION

Equity No. 1408.

THE TOLEDO PRESSED STEEL COMPANY,
Plaintiff,

vs.

STANDARD PARTS, INC.,
Defendant.

Equity No. 1412.

THE TOLEDO PRESSED STEEL COMPANY,
Plaintiff,

vs.

HUEBNER SUPPLY COMPANY,
Defendant.

STIPULATION

(Filed August 12, 1935)

It Is Hereby Stipulated between the parties that the above causes may be tried together on appeal and upon a single record.

Toledo, Ohio, August 3, 1935.

The Toledo Pressed Steel Company,
Plaintiff.
By Owen & Owen,
Its Attorneys
Standard Parts, Inc.,
and
Huebner Supply Company,
Defendants
By Bair, Freeman & Sinclair
and
Holloway, Peppers & Romanoff,
Their Attorneys.

Toledo, Ohio, August 3, 1935.

It is so ordered

Geo. P. Hahn,
U. S. District Judge.

PETITION FOR APPEAL

(Filed September 26, 1935)

Equity No. 1408

To the Hon. George P. Hahn, District Court Judge

The above-named defendants feeling themselves aggrieved by the Decree made and entered in this cause on the 29th day of June, 1935, do hereby appeal from said Decrees to the Circuit Court of Appeals for the Sixth Circuit for the reasons specified in the Assignment of Errors, which is filed herewith, and they pray that their application be allowed and that Citations issue as provided by law, and that a transcript of the record upon which said Decrees were made, duly authenticated, may be sent to the United States Circuit Court of Appeals for the Sixth Circuit under the statutes and rules of said Court as may be provided.

And your Petitioners further pray that proper Orders be made touching the security to be required of them to perfect their Appeals.

It is noted that the parties stipulated in open Court that the two cases above identified should be tried together and a single record made.

Standard Parts, Inc.,
Defendant
and
Huebner Supply Company,
Defendant
By Bair, Freeman & Sinclair,
and Holloway, Peppers & Romanoff,
Their Attorneys.

W. P. Bair,
Of Counsel.
July 22, 1935.

PETITION FOR APPEAL.

(Filed September 26, 1935)

Equity No. 1412.

To the Hon. George P. Hahn, District Court Judge:

The above-named defendants feeling themselves aggrieved by the Decrees made and entered in this cause on the 29th day of June, 1935, do hereby appeal from said Decrees to the Circuit Court of Appeals for the Sixth Circuit for the reasons specified in the Assignment of Errors, which is filed herewith, and they pray that their application be allowed and that Citations issue as provided by law, and that a transcript of the record upon which said Decrees were made, duly authenticated, may be sent to the United States Circuit Court of Appeals for the Sixth Circuit under the statutes and rules of said Court as may be provided.

And your Petitioners further pray that proper Orders be made touching the security to be required of them to perfect their Appeals.

It is noted that the parties stipulated in open Court that the two cases above identified should be tried together and a single record made.

Standard Parts, Inc.,
Defendant

and

Huebner Supply Company,
Defendant

By Bair, Freeman & Sinclair,
and Holloway, Peppers & Romanoff,
Their Attorneys.

W. P. Bair,
Of Counsel.
July 22, 1935.

ASSIGNMENT OF ERRORS

(Filed September 26, 1935)

Equity No. 1408.

Come now the defendants, Standard Parts, Inc. and Huebner Supply Company, and assign the following as the errors upon which they will rely in the prosecution of their Appeals; each defendant assigning as errors in its cause, that:

1. The Court erred in finding that the Withrow and Close patent, No. 1,732,708, is valid at law.

2. The Court erred in that it did not enter a Decree finding said patent invalid as to each of the claims thereof involved in the suit.

3. The Court erred in finding that said patent was infringed by the defendant.

4. The Court erred in that it did not enter a decree finding said patent not infringed by the defendant.

5. The Court erred in entering a decree for an injunction.

6. The Court erred in that it did not dismiss the Bill of Complaint at plaintiff's cost.

Standard Parts, Inc.,
Defendant

and

Huebner Supply Company,
Defendant

By Holloway, Peppers & Romanoff,
and by Bair, Freeman & Sinclair,
Their Attorneys.

W. P. Bair,
Of Counsel.
Des Moines, Iowa.

ASSIGNMENT OF ERRORS

(Filed September 26, 1935)

Equity No. 1412.

Come now the defendants, Standard Parts, Inc. and Huebner Supply Company, and assign the following as the errors upon which they will rely in the prosecution of their Appeals; each defendant assigning as errors in its cause, that;

1. The Court erred in finding that the Withrow and Close patent, No. 1,732,708, is valid at law.

2. The Court erred in that it did not enter a Decree finding said patent invalid as to each of the Claims thereof involved in the suit.

3. The Court erred in finding that said patent was infringed by the defendant.

4. The Court erred in that it did not enter a decree finding said patent not infringed by the defendant.

5. The Court erred in entering a decree for an injunction.

6. The Court erred in that it did not dismiss the Bill of Complaint at plaintiff's cost.

Standard Parts, Inc.,
Defendant

and

Huebner Supply Company,
Defendant

By Holloway, Peppers & Romanoff,
and by Bair, Freeman & Sinclair,
Their Attorneys.

W. P. Bair,
Of Counsel.
Des Moines, Iowa.

ORDER ALLOWING APPEALS

(Entered September 26, 1935)

Equity No. 1408.

Now on this 26th day of September, 1935, this matter coming before the Court on the Petition of the defendants in Equity No. 1408 and Equity No. 1412 for allowance of Appeals to the United States Circuit Court of Appeals for the Sixth Circuit, and the Court being advised, finds as follows, to-wit:

That said Appeals should be allowed.

It Is Therefore Ordered that the Appeals of the defendants, Standard Parts, Inc. and Huebner Supply Company, to the United States Circuit Court of Appeals for the Sixth Circuit are allowed, and a cost bond in each case is set at $250.00 Dollars.

And the parties having stipulated that the causes shall be tried together and a single record made up.

It Is Further Ordered that a transcript of the records, proceedings and papers upon which the Final Decrees were made be duly authenticated and sent to the United States Circuit Court of Appeals for the Sixth Circuit.

Done at Toledo, Ohio, on the above date, to-wit, the 26th day of September, 1935.

Geo. P. Hahn,
United States District Judge.

ORDER ALLOWING APPEALS

(Entered September 26, 1935)

Equity No. 1412.

Now on this 26th day of September, 1935, this matter coming before the Court on the Petition of the defendants in Equity No. 1408 and Equity No. 1412 for allowance of Appeals to the United States Circuit Court of Appeals for the Sixth Circuit, and the Court being advised, finds as follows, to-wit:

That said Appeals should be allowed.

It Is Therefore Ordered that the Appeals of the defendants, Standard Parts, Inc. and Huebner Supply Company, to the United States Circuit Court of Appeals for the Sixth Circuit are allowed, and a cost bond in each case is set at $250.00 Dollars.

And the parties having stipulated that the causes shall be tried together and a single record made up.

It Is Further Ordered that a transcript of the records, proceedings and papers upon which the Final Decrees were made be duly authenticated and sent to the United States Circuit Court of Appeals for the Sixth Circuit.

Done at Toledo, Ohio, on the above date, to-wit, the 26th day of September, 1935.

Geo. P. Hahn,
United States District Judge.

BOND ON WRIT OF ERROR OR APPEAL

(Filed September 27, 1935)

No. 1408 In Equity.

Know All Men By These Presents, That we Standard Parts, Inc., and The Bolser Corporation as principal, and The United States Fidelity & Guaranty Company as surety, are held and firmly bound unto The Toledo Pressed Steel Company in the full and just sum of Two Hundred and Fifty Dollars ($250.00) to be paid to the said The Toledo Pressed Steel Company certain attorneys, executors, administrators, successors or assigns; to which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, jointly and severally, by these presents. Sealed with our seals and dated this 27th day of September in the year of our Lord one thousand nine hundred and thirty-five.

Whereas, lately at a session of the District Court of the United States for the Western Division of the Northern District of Ohio in a suit pending in said Court, between The Toledo Pressed Steel Company, as plaintiff, and Standard Parts, Inc. as defendant, Equity No. 1408, a Decree was rendered against the said Standard Parts, Inc. and the said Standard Parts, Inc. having obtained an Appeal and filed a copy thereof in the Clerk's office of the said Court to reverse the Decree in the aforesaid suit, and a Citation directed to the The Toledo Pressed Steel Company citing and admonishing it to be and appear at a session of the United States Circuit Court of Appeals for the Sixth Circuit, to be holden at the city of Cincinnati, in said circuit, on the 27th day of October, next.

Now the condition of the above obligation is such, that if the said Standard Parts, Inc. shall prosecute its Appeal to effect, and answer all damages and costs if it

fail to make its plea good, then the above obligation to be void; else to remain in full force and virtue.

Sealed and delivered in presence of
(signed) W. P. Bair
(sinegd) W. R. Peppers

Standard Parts, Inc.,
By
(sgd.) George R. Austin,
President (Seal)
The Bolser Corporation
By (sgd.) C. M. Bolser,
President (Seal)
United States Fidelity and
Guaranty Company
By (sgd.) Louis H. Paine,
Its Attorney in Fact. (Seal)

Approved by
(signed) Geo. P. Hahn.
United States District Judge.

BOND ON WRIT OF ERROR OR APPEAL

(Filed September 27, 1935)

No. 1412 In Equity.

Know All Men By These Presents, That we Huebner Supply Company and Kari-Keen Manufacturing Company as principal, and The United States Fidelity & Guaranty Company as surety, are held and firmly bound unto The Toledo Pressed Steel Company in the full and just sum of Two Hundred and Fifty Dollars ($250.00) to be paid to the said The Toledo Pressed Steel Company certain attorneys, executors, administrators, successors or assigns; to which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, jointly and severally, by these presents

Sealed with our seals and dated this 27th day of September, in the year of our Lord one thousand nine hundred and thirty-five.

Whereas, lately at a session of the District Court of the United States for the Western Division of the Northern District of Ohio in a suit pending in said Court, between The Toledo Pressed Steel Company, as plaintiff, and Huebner Supply Company as defendant, Equity No. 1412 a Decree was rendered against the said Huebner Supply Company and the said Huebner Supply Company having obtained an Appeal and filed a copy thereof in the Clerk's office of the said Court to reverse the Decree in the aforesaid suit, and a Citation directed to the The Toledo Pressed Steel Company citing and admonishing it to be and appear at a session of the United States Circuit Court of Appeals for the Sixth Circuit, to be holden at the city of Cincinnati, in said circuit, on the 27th day of October, next.

Now the condition of the above obligation is such, That if the said Huebner Supply Company shall prosecute its Appeal to effect, and answer all damages and costs if it fail to make its plea good, then the above obligation to be void; else to remain in full force and virtue.

Sealed and delivered in presence of
(signed) Margaret Howard
(signed) W. R. Peppers

The Huebner Supply Company,
By (signed) Rudolph Huebner,
Sec'y-Treas. (Seal)

Kari-Keen Manufacturing Co.
By (signed) C. H. Myers,
Vice President (Seal)

United States Fidelity and Guaranty Company
By (signed) Louis H. Paine,
Its Attorney in Fact. (Seal)

Approved by
Geo. P. Hahn,
United States District Judge.

CITATION

(Filed September 28, 1935)

Equity No. 1408.

To The Toledo Pressed Steel Company, Plaintiff, and to Owen & Owen, Its Attorneys:

You and each of you are hereby cited and admonished to be and appear at the Circuit Court of Appeals of the United States for the Sixth Circuit to be held in the City of Cincinnati, in the State of Ohio, Thirty (30) days from and after the day this Citation bears date, pursuant to an Order allowing Appeals filed and entered in the Clerk's Office of the District Court of the United States for the Northern District of Ohio, Western Division, on this date, from Final Decrees, signed, filed and entered on the 29th day of June, 1935, in those certain suits, being Equity No. 1408 and Equity No. 1412, in which respectively you are plaintiff, and in which respectively, Standard Parts, Inc. and Huebner Supply Company, are defendants and appellants, to show cause, if any there be why the Decrees rendered against the said appellants as mentioned in said Order allowing the Appeals should not be corrected and reversed, and why justice should not be done the parties in that behalf.

Witness, the Honorable George P. Hahn, United States District Judge for the Northern District of Ohio, Western Division, this 27th day of September, 1935, and the independence of the United States, the 160th.

Geo. P. Hahn,
U. S. District Judge.

Service of the foregoing Citation and of the Petition for Appeal and Assignment of Errors, and receipt of copies of said Citation, Petition and Assignment of Errors hereby acknowledged this 27th day of September, 1935.

Owen & Owen,
Attorneys for Plaintiff-Appellee.

CITATION

(Filed September 28, 1935)

Equity No. 1412.

To The Toledo Pressed Steel Company, Plaintiff
and to Owen & Owen, Its Attorneys:

You and each of you are hereby cited and admonished to be and appear at the Circuit Court of Appeals of the United States for the Sixth Circuit to be held in the City of Cincinnati, in the State of Ohio, Thirty (30) days from and after the day this Citation bears date, pursuant to an Order allowing Appeals filed and entered in the Clerk's Office of the District Court of the United States for the Northern District of Ohio, Western Division, on this date, from Final Decree, signed, filed and entered on the 29th day of June, 1935, in those certain suits, being Equity No. 1408 and Equity No. 1412, in which respectively you are plaintiff, and in which respectively, Standard Parts, Inc. and Huebner Supply Company, are defendants and appellants, to show cause, if any there be why the Decrees rendered against the said appellants as mentioned in said Order allowing the Appeals should not be corrected and reversed, and why justice should not be done the parties in that behalf.

Witness, the Honorable George P. Hahn, United States District Judge for the Northern District of Ohio, Western Division, this 27th day of September, 1935, and the independence of the United States, the 160th.

Geo. P. Hahn,
U. S. District Judge.

Service of the foregoing Citation and of the Petition for Appeal and Assignment of Erros, and receipt of copies of said Citation, Petition and Assignment of Errors hereby acknowledged this 27th day of September, 1935.

Owen & Owen,
Attorneys for Plaintiff-Appellee.

NARRATIVE CONDENSATION OF TESTIMONY AND OF STIPULATIONS

(Filed September 26, 1935)

(Equity No. 1408. Equity No. 1412)

STIPULATION IN OPEN COURT

Mr. Owen:

It is stipulated that these two causes will be tried together and a single record made up.

Mr. Freeman:

The record may show that Case No. 1412 is being defended by the Kari-Keen Manufacturing Company of Sioux City, Iowa, and that the Case No. 1408 is being defended by the Bolser Corporation of Des Moines, Iowa.

Mr. Owen:

It is stipulated that the plaintiff is a corporation as alleged in the bills of complaint; and that the plaintiff is the present owner of the patent in suit and has been since its issuance.

It is further stipulated that either party may introduce what we call soft copies, uncertified copies of United States Letters Patents, which may be corrected if error is shown; and that a soft copy of the file wrapper of the patent in suit may be introduced.

Mr. Owen:

In connection with the Bolser torch; that is Case 1408, the plaintiff charges infringement of Claims 2, 5, 11, 12 and 13.

As to the Kari-Keen (Case 1412), the same claims, and in addition claims 1, 6 and 7.

Mr. Owen:

It is stipulated that the defendants have sold within this District, prior to the filing of the bills of complaint and subsequent to the issuance of the patent in suit, torches in the Bolser case (Equity No. 1408) like Exhibit No. 3-b, and in the other case (Equity No. 1412) like Exhibit 3-c.

EXHIBITS OFFERED

Plaintiff's Paper Exhibits

1. Withrow and Close patent in suit—No. 1,732,708.
2-a. Drawing—Figure 3 of patent in suit—with terms of Claims 2 and 11 applied.
2-b. Drawing of defendant's torch in Equity 1408 (Bolser) with Claims 2 and 11 applied.
2-c. Drawing of defendant's torch in Equity 1412 (Kari-Keen) with Claims 2 and 11 applied.
4. Circular of plaintiff's first open flame torch.
5. Package of letters of complaint in regard to the open wick torch originally manufactured by plaintiff.
6. Yellow tag sent out by plaintiff with old torches recommending 1½ inch wick exposure.
7. Sketch showing experimental burner with long tube extending into fuel tank.
8. Part of circular showing open flame torch on which plaintiff went into production in 1928. Actual device is shown in physical Exhibit 29.
9. Package of complaint letters about plaintiff's torch, Exhibit 8, open flame type.
10-a
10-b
10-c
10-d
10-e
10-f
10-g
10-h
10-i
10-j

Drawings of experimental torches tried by Plaintiff.

11-a. Circular of plaintiff's construction torch embodying patented burner in suit.
11-b. Plaintiff's direction sheet for burner in suit.
11-c. Plaintiff's truck flare circular.
12. Letters of commendation from plaintiff's customers referring to device in suit.
13. Plaintiff's orders for torches of type in suit from Iowa.
14. Plaintiff's orders for torches of type in suit from other territory.
15. Circular showing letter from Michigan State Highway Commissioner.

16. Anthes license dated August 15, 1933.
17. Test records of oil consumption by open flame burner and plaintiff's and defendant's enclosed flame burners.
18. Test records of plaintiff's enclosed flame burner and open flame burner as to wick consumption.
19a. Bolser circular.
19b. Bolser circular letter.
19c. Letter from Bolser customer enclosed with circular.
20. Kari-Keen circular.
21. Dietz lantern catalog.
22. Dietz first open flame burner circular.
23. Dietz circular showing hooded burner.
24. Dietz latest circular.
25. Circular of McCloskey open flame torch made for him in 1925.
26. Circular of McCloskey torch brought out in 1929.
27. Letter from Iowa Highway Commission.
30. Circular concerning plaintiff's open flame torch.
31. Billingham patent, No. 181,030—catalog sheet.

Plaintiff's Physical Exhibits

3-a. Plaintiff's commercial torch made under patent in suit.
3-b. Bolser Torch — Equity 1408 — (Corresponds to drawing, Exhibit 2-b).
3-c. Kari-Keen torch, Equity 1412 — (Corresponds to drawing, Exhibit 2-c).
28. First Toledo open flame torch made November, 1926.
29. Second Toledo open flame torch made in July, 1928, corresponds to Exhibit 8.
32. Model of Billingham patent, No. 181,030.

Defendant's Exhibits

A. Toledo Pressed Steel Company circular.
B. Old Railroad Flare.
C. Plaintiff's present commercial flare—half cut away.
D. Model—Wenzel patent, No. 577,090.
E. Model—Wenzel patent, No. 577,090, provided with imperforate top.
F. Folding section drawing of Almond Patent No. 193,796, Figure 1.
F-1. Almond drawing with letters of its patent

H. Defendant's burner with removable skirt—(Bolser) — Defendant's flare with removable skirt —(Kari-Keen).
I. Defendant's burner with skirt—(Bolser).
J. Defendant's flare with skirt—(Bolser).
K. Drawing—defendant's flare complained of—Equity 1408 (Bolser).
L. Drawing—defendant's flare complained of—Equity 1412 (Kari-Keen).
M. Bolser circular.
N. Book of patents.
O. Whole circular of plaintiff's Exhibit 8.

TESTIMONY OF WITNESSES

JOSEPH E. WITHROW

I am Joseph E. Withrow, President of the Toledo Pressed Steel Company, the plaintiff. I have been connected with the plaintiff since 1926.

When I first became connected with it, it was manufacturing torches as warning signals. Exhibit 4 is a circular showing the type of torch being made and sold at that time. Our company continued the manufacture and sale of the torch illustrated in Exhibit 4 until July, 1928. We sold them quite extensively as a warning signal for obstructions on highways.

To my knowledge, that particular type of torch was not sold as a warning signal for parked trucks and busses. I know of no warning signal used at that time for parked trucks and busses. They used lanterns.

Our torch of this Exhibit 4 type was then sold to contractors for use in connection with construction work. That torch did not give satisfactory service in that use. The objections to it were that in severe weather, winds and rains, it would continually go out, and would fail as a warning signal. We received many complaints in that connection. I have some of them here selected from others. Some we took out of our files. We had many of them. They were complaints that came in from our customers. Exhibit 5 is a package of these complaint letters.

(Witness reads from Exhibit 5)

This is from the Consolidated Equipment Company, Columbus, Ohio, June 6, 1927. At the beginning:

"With reference to the torches tried out by the City of Columbus, I beg to advise that the writer made a test of two of these torches Saturday.

At the beginning of the test, we were having a heavy fall of rain with a high wind and both torches went out. In fact it was impossible to keep them burning for any length of time.

I then took a brand new torch and a new wick out of our stock, and filled the torch with coal oil from a nearby local filling station, and to my great surprise this torch went out also."

This is from the Yancey Tractor Company, Albany, Georgia, June 15, 1927:

"We recently sold the City of Savannah some Toledo torches, and we are today in receipt of a letter from them in which they advise us that these torches are unsatisfactory inasmuch as the rain puts the light out. This being the case the City of Savannah desires to return these torches, and we would like to ask if it is true that a hard rain will extinguish these lights, as you know we have some very hard rains in this section, and unless the torches will burn during a hard rain we are afraid we will have other complaints."

This is from Hedge and Mattheis Company, Boston, Massachusetts, July 26, 1927:

"I was reading some of your information again which stated that your torches did not go out in a heavy shower and it occurs that recently three different owners have told me that practically all the torches were put out in some of the heavy showers that we have had recently.

"We have wondered if you have found any way to overcome this difficulty."

Another one headed Consolidated Equipment Company, Columbus, Ohio, October 14, 1927:

"We have twenty four of your Toledo torches and note that whenever it rains the torches go out."

The Victor L. Phillips Company, Kansas City, Missouri, February 9, 1928:

"We have a customer who is using some four or five dozen Toledo Torches in the extreme West-

ern portion of Kansas. These are used on three different jobs in different counties and the superintendents on the three jobs report that the wind blows these torches out."

Clarence H. Buell, Syracuse, New York, February 10, 1928:

"I put out a half a dozen Toledo Torches on a trial order and in checking them up I find that they are continually going out during the night."

The same: Clarence H. Buell, March 31, 1928:

"I have placed several trial orders of Toledo Torches in the City of Syracuse and these have worked out fairly well with the exception that they do blow out in a high wind."

Ivan C. Byram, Contractor, Sag Harbor, New York, June 9, 1928:

"It may be some fault of mine, but they always go out in a high wind or when it rains hard."

State of Ohio, Department of Highways, Columbus, Ohio dated at Ashland, Ohio, June 27th, 1928:

"Our department has been using quite a few bomb torches but our Superintendents have been complaining that they are unable to keep them lighted and I am asking if you would kindly advise me specifications covering quality of oil to use.

We have tried fuel oil, coal oil and a mixture of the two but still the majority of the torches will not burn throughout the night."

This is from Mower County, Austin, Minnesota, June 28, 1928:

"Some time ago we ordered and received a dozen of your Toledo Torches. Since receiving them, we have tried to use them, and we find that they will not stay lighted. We would like to receive some instructions relative to their use and reasons why they go out."

G. R. Feldmann Company, Wilkes-Barre, Pennsylvania, July 25, 1928:

"We have had considerable difficulty with our customers in the sale of Torches to them, with the

result that a number of them have been returned to us, owing to the fact that the light goes out through the night on many occasions.

"Mr. Correale of the Correale Construction Co. to whom we sold six dozen has told us that we can take back about four dozen of them as they are not satisfied with the results obtained."

St. Louis County Water Company, University City, St. Louis, Missouri, August 6th, 1928:

"In the last two rains we have had, these torches have uniformly gone out, which we do not feel would make them a satisfactory equipment for our use.

"If you have any suggestions as to the method of using these so that they will burn during a rain, we would like to know it; otherwise, we will be unable to use these torches."

Hunter Machinery Company, Grand Rapids, Michigan, August 24, 1928:

"I was up at the Engineering Dep't. today and they informed me that they are not going to use any more Torches due to the fact that every one of their superintendents and foremen are complaining that they cannot keep them lit.

"They are pulling the wicks out about an inch and a quarter or an inch and a half according to your recommendations and are using regular kerosine oil.

"This matter was brought to my attention also by the Director of Public Service as he has received a number of calls at his home at night time from various people that warning signals are out."

O. B. Avery Company, Saint Louis, Missouri, October 2, 1928:

"We have had three complaints to the effect that rain and wind put out the flames. These are from Ackermann Brothers, 5238 Alabama Ave., St. Louis, Mo., St. Louis County Water Co., 6600 Delmar, St. Louis, Mo., and Tidd and Pimm, Columbia, Mo. We have had some correspondence about the St. Louis County Water Company. We have made the changes that you suggested but they are still complaining.

"Tidd & Pimm are complaining that it is necessary to keep out two inches of wick in order to minimize the difficulty, but in doing so find that they burn up too much oil and that they will not last throughout the night."

The Victor Olson Contracting Company, Youngstown, Ohio, October 11, 1928:

"Our watchman advises us that he cannot make your torches stay lit on windy nights and he does not want to use them any more."

This is from James Stanton and Son Construction Company, Highland, Illinois, October 15, 1928. It is to O. B. Avery Company:

"Some time ago we bought some flares from you. These flares are using too much oil. We would like to know if you have a harder or more tightly woven wick that we could use to replace the wicks that came with the flares."

Hedge & Mattheis Company, Boston, Massachusetts, October 17, 1928:

"We are receiving reports from one of our customers who is using Toledo Torches that he is having considerable trouble with the wind blowing them out."

Clarence H. Buell, Syracuse, New York, November 28, 1928:

"The writer was talking with these people at the Municipal Commission at Herkimer, N. Y. yesterday and find that they are far from satisfied with the results obtained so far. It seems that these people set these torches out about 4:30 in the afternoon and take them in about 8:00 in the morning. Upon arrival at the job in the morning they have found that about half of these torches were out."

Water Commissioner, Southington, Connecticut:

"We bought 6 of your lanterns and put them out in a rain storm the other night and in the morning they were all out. We used kerosene—

The Court:

What is the date of that letter?

A. There is no date on it.

Mr. Owen:

That was written on one of our circulars and returned to us, undated.

Mr. Bair:

Whose testimony is that, about how you got it?

Q. How did you get that, Mr. Withrow? A. That was mailed; as I remember it was mailed direct to us by Mr. MacKenzie.

Q. What kind of torch is shown on the circular upon which that communication was addressed? A. An open flame torch.

Q. The first type you were making, in 1926? A. Yes sir.

In some of the letters I have read, reference was made to the distance or the length of wick that was exposed in our old burner. We recommended an extension of an inch and a half.

This yellow tag, Exhibit 6, we attached to every torch we sent out, instructing them to extend the wick an inch and a half. That covered the open flame torches we were making in 1926 and 1927. That extension of the wick one inch and a half burned the wick very rapidly. The fact of the matter is when a torch was set out at night and taken in in the morning, an inch and a quarter had been consumed. The reason for our recommendation of the exposure of an inch and a half was that when the wick was shorter than that, the torch was likely to go out. An inch and a half was necessary to insure any stability at all.

In an effort to overcome the objections that were raised by our customers, as indicated by the letters from which I have read excerpts, the first thing we did was to take the open flame torches and submit them to different weather conditions for a period of time to try to determine just what it was that made them go out. In doing so, we discovered that a cold wind or cold weather would induce them to go out more quickly than the warmer weather; which led to the idea in some way to pre-heat the oil before it reached the flame. We took a steel rod and inserted it between the wick and wick holder and extended it down to the oil. We found that heated the oil some and did produce a better result. Then we took a tube and surrounded the wick with a tube, and inserted it in the lower end of the sleeve which held the wick, and extended it down into the body of the torch. We found

that increased the efficiency some, but it was impractical from a production standpoint, so we abandoned that. It was too expensive and unhandy. It was a long ungainly burner.

Exhibit 7 represents one of the experiments to which I have referred. It shows a tube surrounding the wick inserted in the lower part of the sleeve, which held the wick. As result of these experiments, we shortened the tube surrounding the wick, eliminating the extension of the tube above the torch, that is the portion that was exposed to the wind, and had a flat-top burner with all of the tube extending down in the torch. That is represented by Exhibit 8. On this, we finally went into production in July, 1928. In that torch, we extended the wick tube down into the body of the tank and eliminated the exposed portion of the wick, which had been present in our earlier torch.

The theory on which we eliminated that exposed portion of the wick tube was that it was exposed to the wind and the wind would cool it, and in turn, the cooling of the tube would cool the wick and the oil contained in the wick. So that at the time we brought out this improved burner, our idea was that there should be no projection of metal above the body of the torch and where it contacted was closer to the oil.

Mr. Close worked with me in these tests and experiments. This improved burner on the market did not overcome the objections that had been raised to the first open flame burner. It did not have quite as many objections. It was not produced for so long a period. We kept it in production from July to the end of December, 1928.

I have a few letters showing complaints about that type of torch.

(Witness read from Exhibit 9)

From the Victor Olson Contracting Company, Youngstown, Ohio, September 29, 1928:

> "Our watchman advises us that your torches will not stay lit.
>
> "We purchased some of your new burners and they are no better than the other ones."

P. F. Connell Paving Company, Little Rock, Arkansas, October 16, 1928:

Mr. Owen:

I don't believe that letter contains a complaint; it simply refers to the new burners. You might read the first paragraph.

Witness:

"Please ship us as soon as possible two dozen of your new burners for the Toledo Torch. We have had considerable trouble with the old ones and if these are OK we will order some more."

Dominion Equipment and Supply Company, Limited, Winnipeg, Canada, October 27, 1928:

"The Manitoba Telephone System tried out one of your standard Toledo Torches, also the Toledo Torch Special and they had trouble in keeping them burning. Wind and rain extinguished the flame. Their watchman has recommended not using torches, as they have very few mishaps with lanterns and he has plenty of time to keep them in condition."

The "Special" we called this—the one with the tube extending down into the body of the torch, produced in July, 1928. It was illustrated in Exhiibt 8. We continued our experimental work after we had produced the torch illustrated in Exhibit 8. We realized it had not fully solved the difficulties or the objections to the old torch. It was some better, but was not satisfactory.

Our experimental work after the introduction of this Exhibit 8 torch, included the building of baffles on top of this last "Special" burner, for breaking the wind and reflecting heat back to the wick to see if we could get better volatilization. We tried many different kinds of devices,—Mr. Close and I,—and through these experiments we finally arrived at the idea of reflecting the heat from the top as well as the sides.

These experiments continued over four or five months. As to the time, Mr. Close and I put in on them, they were being conducted continually for several months. We were doing some other things at the same time, but we never stopped working on these. We always had torches going. We would actually build these different types of torches and test them out and compare them. When we found one better than the one we had, we would discard the poorer one and try new experiments. We tried them on the roof of the Factories Build-

ing, which was high and gave us extreme weather conditions. We had a wall there that we could set the torches on and watch them from our office windows, right from where we were sitting at our desks and observe the effect. We could see them when they were extinguished.

I can produce sketches of some of these various experimental torches arranged in the order they came in our experimentation; offered as Exhibits 10-a to 10-j.

Exhibit 10-a had some baffles, spot-welded on the special burner, enclosing the wick and leaving four slits or air ports on the side, with no top.

Exhibit 10-b was the same as Exhibit 10-a, except we added some pieces around the top, joined together, which more nearly enclosed the wick, but left considerable air space for combustion.

10-c was the first attempt at a complete cap, of having any metal over the top at all, which was cup perforated all over.

10-d was surrounding the wick with a circular wall, which was perforated, and adding an imperforate top in the form of a disc.

10-e was a cup with an imperforate top and diagonally slotted holes around the side.

10-f was a cup with an imperforate top, with round holes around the side.

10-g was a cup with a more pointed top, with square holes immediately under the top, and also another set of holes right next to the torch.

10-h is practically the same as 10-g, except that it is a cut-away, showing the addition of a slight raise in the wick holder.

10-i was a cup with an imperforate top, and rectangular holes near the top and circular holes near the torch.

10-j was of a type practically the same as the present burner.

These sketches do not represent all the different types we made up and tried out. They more or less mark the milestones in the development. There were many more, but after six years I do not even remember all of them.

As result of these experiments, we placed on the market, torches like plaintiff's Exhibit 3-a. I have some circulars here advertising this new torch of the patent in suit.

Exhibit 11-a is a circular and Exhibit 11-b a direction sheet. 11-c shows a truck flare.

As to the difference between a torch and a flare, a torch is for the contracting industry, where there are larger sizes; where they set them out over night to guard obstructions in the street. A torch has come to be known as a flare, when carried by a truck for the purpose of guarding it when it is stationed on the road at night. The burner part is the same in torches and flares. The body is a different shape. The truck flares are of smaller capacity.

We introduced this new torch on the market in January, 1929. It met an immediate and enthusiastic reception. We received many letters from our customers relating to it. They are Exhibits 12, 12a and on through as far as they run.

Q. Will you refer to a few of those letters; and you might glance through them and read the short pertinent excerpts? A. This is from the Northfield Iron Company, Northfield, Minnesota, January 8, 1929:

> "P. S. The sample worked to perfection except it is hard to put out. Takes a handful of snow to put it out. You can't blow it out. Also it is hard to light. Will talk it over at the Road Show."

Hunter Machinery Company, Milwaukee, Wisconsin—

The Court:

Have you had those marked, Mr. Owen?

Mr. Owen:

They will be Plaintiff's Exhibit 12.

The Court:

12-a.

Mr. Owen:

-a, right, on through as far as they run.

The Court:

What is the caption, "Testimonials"?

Mr. Owen:

They are not testimonials; they are voluntary letters received from customers regarding the patented torch.

The Court:

"Voluntary letters of commendation"; would that be all right?

Q. You may proceed? A. Hunter Machinery Company, Milwaukee, Wisconsin, January 15, 1929:

"With reference to your new torches, we have been besieged with inquiries as to whether or not the new style burner can be replaced in the old style torch, and if so, what the cost would be. In fact, we have some six dozen old torches on hand, and, of course, we will do our best to dispose of this stock before ordering new style torches, unless it is possible to insert the new style burners in these old style torches."

Edward R. Bacon Company, San Francisco, California, January 23, 1929:

"Without doubt we shall from now on sell only the 'Leader' Torches, equipped with Economy burner, therefore we have wired you to send us by parcel post immediately, one gross of Economy Burners complete with Adaptors, which we contemplate using in the stock of Torches approximating one gross, which we have on hand."

Q. You gave the name of "Economy Burner" to this new torch? A. We did, that is. "Economy Burner" was the name of the burner itself:

"We are very much pleased with the Economy Burner and would not be at all surprised if the end of the year 1929 finds our Company in the first position as regards sales of Toledo Torches, instead of third as in 1928.

"Congratulating you upon this remarkable improvement in your product, we remain—"

Iowa State Highway Commission, Ames, Iowa, January 25, 1929:

"We have had some little trouble with our torches blowing out in the winter gales. We understand that you have recently brought out some sort of a cap that fits over the wick and does away with this trouble. If so, will you please send us details, and, if possible, a few samples to try out. We will be glad to cover these samples on our next order if the device is what we need."

Q. Did you receive an order from the Iowa State Highway Commission thereafter? A. Yes, we did. Here is their Order No. 2363, April 24, 1929, for fifty dozen Economy Burners, complete.

Q. Did that mean complete torches or just the burners? A. That meant the burners, to put in their torches they already had.

Board of Park Commissioners, Minneapolis, February 6, 1929:

"'Mr. F. S. Geng tells us that they are at present using McCloskey bomb torches fitted up with your burners and advised that we get in touch with you since you make the torch complete. Mr. Geng stated that your burner gave good satisfaction during strong winds while the McCloskey burner did not.

"'We are at present using red lanterns which are of little use.'"

Q. Do you know what McCloskey burner that referred to? A. Presumably it would be the open type burner. The fact of the matter is at the date of that letter he had not yet come out with his new burner.

Northfield Iron Company, Northfield, Minnesota, February 8, 1929:

"'I demonstrated the Torch on one of our windiest nights here lately and was surprised the next morning to see what a small amount of oil had been consumed. During this demonstration one of the State Highway Commissioners (Mr. C. T. Bates) took a couple of his friends out to examine it, said he kicked and rolled it, but it kept on burning.'"

General Utilities Company, Inc., Norfolk, Virginia, February 26, 1929:

"The writer talked to Mr. E. T. Gresham of E. T. Gresham & Company over the phone today regarding the Economy Burner which we furnished him to try out on his present Toledo Torches and he stated he is very well pleased with this Burner.

But—the feature that seemed to impress him more than anything else was the fact that with the new Economy Burner the light or at least the Torch gave a much better light and at the same time the Economy Burner eliminated all chances of their being blown or rained out, as he stated that with the standard burner that regardless of wick, etc. as he had followed instructions carefully that now and then a torch would either be

blown or rained out but this was not the case with the Economy Burner.

He said that the Torch also burns longer with the Economy Burner and that he had followed instructions carefully but it did not burn 50% longer nor could he see that there was a saving of 50% in fuel but he did state that the torch did burn longer and gives a good deal more satisfactory light but it did not amount to 50% and he thought that 25% was a little closer."

Edelen & Boyer Company, Philadelphia, February 26, 1929:

"We have had a number of inquiries lately and several of them fairly good size, but have lost them due to the fact that we did not have the torch with the Economy Burner. What we should have is Economy Burners with Adapters to fit 91 Standard Torches which we have on hand.

Will you kindly ship these to us so we can bring our torches up to date and dispose of them."

Cusack Hardware Company, Philadelphia, April 3, 1929:

"We note from recent sales that your new torch 'Leader Model' is becoming quite popular."

Andrew Weston Company, Inc., Woodmere, New York, April 16, 1929:

"We have tried one dozen of these protectors and find that your torches equipped with this protector are far superior to the ones with the unprotected flame."

The Ohio Bell Telephone Company, Cleveland, May 20, 1929:

"Our Plant Department have just advised me that the torch will stay lit in heavy storms and it is almost impossible to either upset or extinguish by traffic or by storm. They advise me that no doubt the torch is a very good one, but as I advised your Mr. Lasko who called upon me, that due to the fact that our company did very little conduit work, the majority of which is contracted we do not feel that we will be in a position to make use of a torch of this type. The cases would be

very remote where it would be necessary for us to use either illumination or danger signals for work of this nature."

Manchester Water Company, Manchester, Connecticut, May 22, 1929:

"We are very much pleased with the torches that we purchased from you a short time ago and we would like you to send us by freight 6—'Champion' Torches, 3—Economy Burners, 3—Wicks for same."

R. B. Wing & Son, Albany, New York, June 1, 1929:

"We have been selling quite a few of your torches lately which we had in stock with the old type burner on them. However, most of our customers seem to prefer the economy type burner, and we have therefore for their convenience taken off the old type burner and put on the new ones."

United States Department of the Interior, Indian Irrigation Service, Federal Building, Los Angeles, California, September 3, 1929:

"Will you please advise who your agent is for Toledo torches in the city of Los Angeles, California.

I have called several dealers who I thought perhaps could inform me but have not met with success.

This office is in the market for six of these torches and we do not wish a substitute."

Pidgeon-Thomas Iron Company, Memphis, Tennessee, September 7, 1929:

"The writer was in conversation with the General Superintendent of the Memphis Street Railway Company today about Toledo Torches and Mr. Haylow, who is the superintendent advised me that he had a number of torches on hand but they were not satisfactory, due to the fact that the flames would spread and go out under heavy winds of fast moving traffic along where these lights were placed. He also advised that he was in Cleveland, Ohio a few weeks ago and while there visited with the Superintendent and General Manager or whoever is in charge of the Cleveland

Street Railway Company, he did not mention the name, and they advised him that they were using Toledo Torches for their lighting system on same design. He explained to them the same trouble that he explained to me and they advised him that they had the same trouble but you corrected this trouble by furnishing them with caps for their torches and since getting these caps the torches are answering the purpose much better than anything else they could use and in fact they were more than pleased with the results they were having.

Mr. Haylow, here with the Memphis Street Railway Company advised that I write you about this trouble and see if you would not furnish them with caps for the torches they now have on hand. If so, he was inclined to believe that he could use more torches for his work, and I might add that they have very extensive improvements going on at the present. I believe that if you could help us on this subject we would be in position to demand and get practically all of his requirements in the way of danger markers, which namely is the Toledo Torch."

General Utilities Company, Norfolk, Virginia, November 13, 1929:

"The last firm was a little skeptical about the Torch and took six to try out and in ten days came in and bought two lots of six more and seemed very enthusiastic about them."

The Court:

How do you put these lights out?

A. You can blow them out with your mouth.

T. A. Keeley Company, Dover, Ohio, May 20, 1930:

"We have just received a shipment of two dozen of these torches through the J. C. Neeley Co., Canton, Ohio, and we are so pleased with them that we have decided to discontinue the use of lanterns in our work in the future."

Howard Cooper Corporation, Portland, Oregon, May 28, 1930:

"Answering your letter of May 26th regarding the over-shipment of Standard Toledo Torches.

would advise that we do not have any demand for the Standard Torches. As you know, we advocate and push the sale of Leader Torches, with Economy Burners."

McMaster-Carr Supply Company, Chicago, August 14, 1930:

"We received an order yesterday for fifty (50) Leader Torches which we were obliged to send to your factory because our customer wanted immediate shipment and we do not have the necessary number of burners on hand to convert the torches which we have in stock into the Leader Model."

From our experiments referred to, we found that some types of torches would work better in some conditions of weather and others in other conditions of weather.

We would develop a burner that would withstand wind and rain; then when we got a very calm day, it would not work as well as some of the others. We had to combine a number of features together to get one that would work in both cases. That is the burner we finally developed. That is the one that had no holes in the bottom. It would not work so well in calm weather, although it did work in the wind and rain.

If we had large openings in the top, it would work in wind but not in perfectly mild weather.

Q. You referred this morning to some orders from the State of Iowa on this new torch. Refer to the other orders you received from the State of Iowa or from the Highway Department both for the completed new toreh and for the burners for use in the old torches. A. I have them here.

Q. You have orders? A. I have them here.

Mr. Owen:

These orders will be offered as Plaintiff's Exhibit No. 13.

Q. Will you refer to those, just giving the items that refer to either the complete new torch or the burner, giving the dates. A. From Iowa State Highway Commission, under date of March 22, 1929, 3 Economy Burners, delivered; April 12, 1929, 50 dozen torches; June 26, 50 dozen torches;—these are all Iowa State Highway Commission—

Q. Yes? A. June 26, 9 dozen Economy Burners; January 5, 1932; 10 dozen torches, 4 Economy Burners; March 1, 1932, 10 dozen torches; March 12, 1932, 20 dozen torches; July 13, 1932, 10 dozen Economy Burners; August 3, 1932, 40 dozen Economy Burners; August 9, 1932, 20 dozen Economy Burners; August 24, 1932, 20 dozen Economy Burners; September 15, 1932, 20 dozen Economy Burners. Those are all of Iowa State Highway.

Q. Those orders for Economy Burners; what did you understand they were for? A. They were for substituting on torches that formerly were of the open flame type.

Q. They had been a customer of yours on the open flame torch, had they? A. Yes, we sold many of them.

Q. Have you any orders or a copy of any orders from different customers, ordering this Economy Burner for use on the old type torch? A. I have.

Mr. Owen:

These other orders will be offered as Plaintiff's Exhibit No. 14.

Q. Will you refer to them in the same way?

The Court:

What is the use of going into detail on them. Give us the aggregate.

Mr. Owen:

I don't believe they are aggregated.

The Court:

Just put them in a bunch. You are going to show ultimately how many you sold?

Mr. Owen:

Yes.

This does not represent all the Economy Burners we sold. These are just some of the orders I selected.

I stated that we did not sell the old open flame torch for use as a warning signal for parked trucks and busses. We do sell our present Economy torch and burner for that purpose.

That field first came to our attention from a dealer writing in to us and informnig us of a law passed in Michigan requiring trucks to carry torches as warning signals when they were parked on the road at night. We followed that up by advertising over the radio from Detroit. I don't remember the details; either we or one of our dealers submitted the Economy burner to the Michigan State Highway Department.

Exhibit 15 is a circular reproducing a copy of a letter we received from the Michigan State Highway Department dated October 24, 1929, accepting our Economy torch for that purpose.

Witness reads letter, which is part of Exhibit 15, (Record Page 45).

After that we sold these Economy burners and torches for similar uses in many States. As far as I know, they have been accepted in all States where such regulations have been adopted. I don't know of any where they have not been accepted. We sell a great many of them for that purpose.

There is no place I know of where red lanterns are acceptable for these purposes under those regulations, nor are there any open flame torches acceptable so far as I know.

We marked our present torches and flares "Patent Pending" as soon as we made application for patent, and just as soon as the patent issued, we marked them with the patent number. All of those made and sold since the issuance of the patent have been marked with the patent number.

In 1933, we sold 76,919 Economy torches, flares and burners. In 1934, 56,401.

Bolser and Kari-Keen torches first appeared on the market in 1933 about the middle of the year. They have been keen competition for us since their appearance.

Other companies have sold torches or burners embodying similar construction since we put our patented torch on the market. There was the Shanklin Manufacturing Company, the K-D Lamp Company, the Doray Lamp Company, The Anthes Force Oiler Company and some others. They all entered the field subsequent to the time our torch was introduced. Some of the Companies have taken licenses under the patent in suit, including the K-D Lamp Company, Cincinnati, Ohio, April 30, 1934; The Doray Lamp Company of Chicago, April 14, 1934; and The Anthes Force Oiler Company of Fort Madison, Iowa, on August 15, 1933.

Exhibit 16 is the Anthes license. The licenses are all on the same terms. The rate of royalty is 3c on each complete burner, whether sold as a burner or torch. I don't know of any of them selling just as burner. They all sell complete torches.

Exhibit 17 shows experiments for the purpose of giving data on the reduction in oil and wick consumption by our patented torch. These tests were made with a torch using our open flame burner, a truck flare of our make with the Economy burner, a Bolser flare and a Kari-Keen flare. We filled them with oil, weighed them, put them on the roof and lighted them under conditions that were recommended for their operation to the customer.

By that I mean, in the old style open flame burner we extended the wick an inch and a half and in the other torches we extended them about one-eighth of an inch, which was what was recommended.

Exhibits 3-a, 3-b and 3-c are the same as the Bolser, the Kari-Keen and our present torch used in these tests, and the other, the open flame torch was our first type with the wick tube extending up above the tank.

On one test, the torches were lighted at 8:25 a. m. on April 12th and extinguished at 5:05 p. m. The open flame-torch used two pounds, one ounce of oil. The truck flare with the Economy Burner, one pound, two ounces; the Bolser flare, one pound, nine ounces; the Kari-Keen flare, one pound, four ounces.

On April 15th, they were lighted at 8:00 a. m., and run to 5:30 p. m. The open flame burner used 2 pounds, 13 ounces; the Economy burner with the truck flare, 1 pound 2 ounces; the Bolser flare, 1 pound, 10 ounces; the Kari-Keen flare, 1 pound, 5 ounces.

On April 16, they were lighted at 8:45 a. m. and ran to 6:00 p. m. The open flame consumed 2 pounds, 14 ounces; the truck flare with the Economy burner, 1 pound; the Bolser flare, 1 pound, 10 ounces; the Kari-Keen flare, 1 pound, 4 ounces.

On April 17, they were lighted at 8:30 a. m., and ran to 5:30 p. m. The open flame used 2 pounds, 14 ounces; the truck flare using Economy burner, 1 pound, 2 ounces; the Bolser flare, 1 pound 6 ounces, the Kari-Keen flare, 1 pound, 4 ounces.

On April 18, they were lighted at 8:10 a. m., and ran to 5:30 p. m. The open flame used 2 pounds, 13 ounces; the truck flare using the Economy burner, 1 pound, 3 ounces; the Bolser flare, 1 pound, 12 ounces; the Kari-Keen flare, 1 pound, 5 ounces.

April 19, they were lighted at 8:40 a. m. and ran to 5:20 p. m. The open flame used 3 pounds, 4 ounces; the

ruck flare using the Economy burner, 1 pound, 7 ounces; e Bolser flare, 1 pound, 10 ounces; the Kari-Keen are, 1 pound, 3 ounces.

On April 30th, we made a different test. We had a indy morning. We ran from 8:40 a. m. to 2:40 p. m. ith the same four torches. The truck flare using the Economy burner, the Bolser flare and the Kari-Keen are remained lighted throughout the period. The old-style burner was extinguished by the wind at 9:07 a. m., 30 a. m., 9:59 a. m., 10:10 a. m.; and then there was 1:32 a. m. that Mr. Close re-lighted,—also at 12:54 p. 1:06 p. m., 1:14 p. m., 2:15 p. m., and 2:40 p. m. When he old style burner was extinguished at these hours, it as immediately relighted either by me or Mr. Close. The other types were not blown out.

We also made tests of the open flame burner and our Economy burner for the purpose of determining wick consumption. They are shown in Exhibit 18.

We put the wick out on the open flame burner one nch and a half as prescribed in our directions, and on he Economy burner from one-sixteenth to one-eighth of an inch. We found that there was much more wick con-sumption with the open flame burner than there was with the Economy burner.

Of the four different styles shown in these notes—Exhibit 18—No. 1 was using the present burner; No. 2 was the present burner, but with a slotted hole cut in top; No. 3 was the present burner with the top com-pletely cut out; and No. 4 was the old open flame burner.

Mr. Close worked with me on the last test (Exhibit 18) and the previous one (Exhibit 17) was with Mr. Frehcit, one of our employees.

CROSS EXAMINATION

The letters of Exhibit 5 all refer to flares like Ex-hibit 4, the old open wick flare. I imagine we answered these complaint letters. I do not have the answers here. I will produce the answers.

We are no longer selling flares like Exhibit 4. We stopped about 1932.

Defendant's Exhibit A is a circular put out by the Toledo Pressed Steel Company, published prior to July 30, 1929.

As to whether when this circular was put out, we had made tests to determine whether the torch referred

to in the circular would stand wind and rain, I don't know when this was put out. I would say that the circular was put out before the complaint letters of Exhibit 5.

The torch of Exhibit 4 is one of which we sold a very considerable number. There is no difference between it and the torch of defendant's Exhibit A.

For all practical purposes, the torch we sold a good many of before we put out the torch involved here, is the torch of Exhibit A.

As to when it was we found out that this torch of Exhibit A, which is the same as the torch of Exhibit 4·

> "will burn through wind and rain for more than twenty-four hours, if necessary, on one filling."

that was some of the tests we had made at the time they were first put out. That is the same kind of torches referred to in the test report I have made here, that went out so many times in the wind. We did send out to the public this circular from which the quotation has been given. We rarely got complaints about the torch of the patent going out in the wind. Usually we discovered on investigation that it was because of their not understanding the instructions. Some times it is a choked wick; sometimes it is bad oil; but never when they are properly adjusted and proper oil used.

We never have complaints about that torch going out unless it is improperly adjusted.

It is true that I did not read from Exhibit 5 that part of the letter from Clarence H. Buell, dated November 28, 1928, reading

> "The reason that bunch of torches went out was because they burned up all the kerosene in the torch."

We did not go into production on this torch like Exhibit 7.

Q. With reference to Exhibit 8, do you have the compiete circular from which Exhibit 8 appears to have been cut?

Mr. Owen:

I have some of them here. I don't know that I have them here, but I have them at the office, I am sure. I will give you one tomorrow morning.

As to when the circular Exhibit 8 was put out, I would have to guess at it. I imagine it was put out about July, 1928.

As to whether this device at that time would not go out in the wind depends on the intensity of the wind. We thought it was better in comparison with the old torch, Exhibit 4. We did not abandon it until we evolved the burner we use at the present time, which was so much better than that, we changed.

When we said in this circular

"The secret of all weather dependability"

we meant it was the best one for all weather dependability that we then made.

These drawings of Exhibits 10-a to 10-j inclusive were made recently from memory and the order in which we put them was also from memory. We have no shop records available showing when these various devices in these 10 drawings were made. My recollection is they were developed and made in the order in which they were introduced here. Mr. Close and I designed them and made them.

We both designed the one of Ex. 10-a. I can not distinguish between the part contributed by me and the part contributed by Mr. Close. We both contributed equally to the development of 10-b. As to whether that is true of 10-c to 10-j inclusive, I don't remember any distinction of any kind. We discussed each design between us before going into production. We worked together and discussed many ideas we never even made models of and discarded them when seemed impractical.

As to what became of the burners, 10-a to 10-j, inclusive, we carefully preserved them. When we removed from the Factories Building to our present location, they disappeared in transit somewhere. When we got there we looked through the building and couldn't find them. We searched everywhere and could not find what had become of them. So far as I know, they are not now available. We even went down to the city dump and couldn't find them there.

Mr. Close made the drawings here to illustrate these devices 10-a to 10-j.

We refreshed each other's memory on the matter.

Q. It is true, is it not, that the changes, the successive changes from 10-e to 10-j, were made not so much

to prove the quality of the burner as an operating device as to produce a burner which could be better produced with the factory equipment that was available? A. Not without consideration of performance; there was that element also in it.

I would say in calm weather there is better performance in Exhibit 10-j than in 10-e.

We put out our first truck flares, I think in 1930 or 1931. I could not say whether I have a copy of our first advertising literature on them. I will produce it if I can find it.

Mr. Owen:

I will if I have it. This Exhibit 11-e is the only one I brought over.

Witness:

That is not the first one.

Mr. Bair:

What I want to get is the first one.

Mr. Owen:

Mr. Close says the first one is this Exhibit No. 13 with the letter in it.

I am not sure when that was put out; whether it was in 1930.

The Court:

The letter is dated?

Mr. Owen: —

1929.

Q. Your recollection is that the circular was put out in 1931? A. No, we were making that torch at that time.

The Court:

1929 is the letter.

Mr. Bair:

What I am trying to find out is whether the torch as a truck flare was being put out at this time in October, 1929, or whether it was put out later.

Q. Do I make myself clear? A. Yes. I was trying to clear my mind on the matter just when it was we made the model F. It was either then or shortly after that.

Q. Were your first truck flares the old construction torch without change? A. You mean the open flame burner?

Q. No, no, the one with the Economy burner? A. Oh, no; we made a flatter torch which was not quite so tall as those.

Q. That is the one that came out in 1930 or 1931? A. Yes, that is my recollection.

Q. Referring now to Exhibits 11-a, -b, and -c, can you tell us when they were put out? A. 11-a was—we have had so many torches I would not know exactly what the date of that was; it was after 1929; my recollection is that it was one we had three or four years ago. Exhibit 11-b, I believe is the same as we have used since the introduction of the Economy Burner, in January, 1929. c I think was put out about June or July of last year.

Exhibit 11-c was the first literature we put out with two or three flares arranged in a box or container, for sale to vehicle drivers. That was about a year after both Kari-Keen and Bolser had put out flares,—three in a box.

I do not know whether the requirements of Wisconsin and Indiana permitted the use of open wicks for highway construction signal flares. I don't know whether or not they both permitted the use of red lanterns. I am not familiar enough with the Highway Commission requirements to say whether any of them or what proportion of them permitted the use of fusees. A fusee is a powder enclosed in a cardboard container like the red flares they have. I think it is the thing they used on railroads for signals.

Q. Do you know how many of the state highway commissions' specifications permit the use of fusees for highway signals for trucks? A. To my recollection I have seen literature stating they were used in the State of Pennsylvania; they used them in Ohio; and others, I wouldn't know.

In regard to other companies selling torches familiar to the ones involved under our patent, I mentioned four companies. There are still others. There are some differences in all of them, slight differences. The Dietz Company in 1929 manufactured a torch with a hood on a bale. When the bale was placed erect, the hood would cover the flame. They kept to that type until they developed a flare for use on trucks. The first of those I saw was about June of last year. Dietz was not manufacturing this first hooded type when we went on the market with our Economy burner.

Referring to the tests of Exhibit 17, the wicks used in the four burners were not of the same size.

As to whether the size of the wicks involved makes a difference in the amount of fuel consumed, strange to say, I found out at that time that is not true. It would be a wide statement to say that wicks of all sizes consume the same amount of fuel.

If the construction of the flare is otherwise the same, I have tested with one-half inch and three-quarter, which are the two sizes in these two torches, and I have come to the conclusion from experiments that it is a matter of surface exposure and not diameter of wick.

I don't remember any conversation in which any representative of the Anthes Company told me they would rather take the license than go to the expense of litigation. Mr. Anthes did not tell me that that I know of.

At the time we prepared the application for the patent in suit, we did not have any idea of using the torch as a truck flare. It is not true that these torches or flares can be used either for signals or for heating purposes. That idea was a failure. Once in a while you get an individual who has an idea and suggests a use for them, and often they will try them out and say they are satisfactory, but when you follow up, you will find out they are not.

Q. So that the advertisement put out as part of Defendant's Exhibit A, which shows the Toledo Torch used for heating a batch-box, shows a thing that did not pan out. A. For the one individual; but we could not make any commercial success of it.

As to why, I don't know, unless it did not produce sufficient heat in cold weather to heat the batch box. I couldn't say whether it would be a matter of how many torches you used.

RE-DIRECT EXAMINATION

Our wick referred to in Exhibit 17 was of three-quarter inch diameter on the patented flare and the open flame one. The Bolser and Kari-Keen were one-half inch wicks, I would say. They were the wicks that came on the commercial flares.

Exhibit 21 is a Dietz Company lantern catalog. I saw a catalog similar to this long before 1925. Dietz Company first put out a torch or flare around January, 1929. It is illustrated in Exhibit 22. It was put out prior

to the placing on the market of our patented torch involved in this case, but almost at the same time. It was put out only for a short time.

Exhibit 23 represents a later type of torch put out by the Dietz Company. It followed their open flame type. They did not sell the open flame torch very long. It was a matter of months. They put out the torch of Exhibit 23 early in 1929.

I would think we put out our present type torch in January of 1929. This Dietz torch came out after that.

Exhibit 24 illustrates the latest Dietz type recently put out. It came after Exhibit 23 but whether it supersedes it or not, I could not say.

I have a copy of a letter Mr. Fraser sent them notifying them of infringement.

We sell the burner alone for $4.00 a dozen with the adapter. We get between 30c and 40c for the torch itself. That is the flares. The torches average about 80c or 90c for the complete torch. The 3c royalty applies to the complete flare and to the burners when sold separately.

RE-CROSS EXAMINATION

I will do my best to find the earliest record of a sale or of distribution of literature soliciting sales of Economy burners.

LYMAN W. CLOSE

I am Vice President of the Toledo Pressed Steel Company and have been connected with the Company since its incorporation in 1925. It succeded a partnership that was making warning signals prior to the date of the incorporation about three months. The first ones were marketed through Mr. McCloskey. We discontinued marketing them through him in May, 1925.

Exhibit 25 is a circular which represents the McCloskey torch which we made for them. McCloskey or his associates continued the manufacture and sale of that torch after they severed relations with us, until March or April, 1929. Then they revised the burner, putting a cap over the wick, similar to the one we brought out. About three months after we brought out our present burner, McCloskey came out with this enclosed type.

Exhibit 26 represents the torch McCloskey brought out in March or April of 1929.

We brought suit against McCloskey for infringement of the patent in suit.

The Court:

You have already covered that. He went through bankruptcy and you abandoned the suit.

I worked with Mr. Withrow on the experiments conducted in bringing out the present torch. I made the sketches, Exhibits 10-a to 10-j. They represent developments during the progress of experimentation.

I don't know of any place where open flares and red lanterns are used as warning signals on highways in connection with parked trucks and busses at the present time.

I am familiar with the complaints made against the open type torch and with the correspondence with reference to the new patented torch.

I would say that the trade everywhere generally accepted the present type torch. I know of some complaints made on its performance. After chasing them down they have been discovered to be only due to faulty operation or lack of following instructions.

The Court:

With the method of use rather than the merit of the device, correct?

A. Right.

I have attended two tests to which warning signals were subjected by different States in deciding whether or not they will be acceptable for use on their highways —one at the Iowa State Highway Commission and one at the Ohio.

The Iowa one consisted of a wind test and a rain test, as well as a duration test. The wind test was conducted in a wind tunnel constructed of a large sewer pipe, through which a current of air was driven. The torch was placed at one end of the tube for one velocity and at the other end for another velocity.

The Court:

Would an electric fan blow out your torch?

A. If placed close enough.

The Court:

How close would that be?

A. Six inches, and directed right at it.

The Court:

Six feet away it would not do it?

A. It would not do it.

The wind velocities in the Iowa test were twenty-six and forty miles an hour. The torches were required to withstand the test five minutes at forty miles an hour and fifteen minutes at twenty-six miles an hour. There was also a precipitation test in which a certain amount of water at a measured rate was dropped into the sewer pipe and deposited against the torch, not only through falling but being driven by the wind.

I have a letter (Exhibit 27) from the Iowa State Highway Commission explaining their tests, how they are conducted and the results as to the different types of signals that have been submitted. I called up Mr. Morris who conducted the tests and asked him if he would give me a statement and this letter was sent in response to that requested.

In the Iowa test, there were ten different torches. Three or four of them were not in commercial production. Of the commercial torches, there was the Bolser, the Kari-Keen, the Stay-Right, ours and McCloskey's.

No open flame torches were submitted, although we did make a test on one of our own out there. The open flame torch did not pass the test.

At the Ohio Commission test, they had a similar test, except it was a wind tunnel in the mechanical laboratory. It was a wind that had an accurately calibrated wind velocity; they could vary it to suit themselves. The torches were placed in proper position in front of the orifice and the wind blown upon them in the same manner as in Iowa, except they had a thirty-five mile an hour wind which the torches had to stand for fifteen minutes.

The torches tested in Ohio were the Shanklin, the torches of the defendants, our torch with the Economy burner and our torch without. Our Economy burner passed all the tests and the open flame did not.

We determined by that test that a wind velocity of approximately thirteen miles an hour would extinguish the open flame.

Our Economy burner was not extinguished in any direct test. We finally did smother it out, but did not blow it out. The test with a measured precipitation fall-

ing upon the top of the torch did not affect the Economy burner. We did not test the open flame in the precipitation test.

I have regulations issued by the State Highway Departments of Iowa, Ohio and Indiana for the use of warning signals by trucks and busses when parked on the highway.

The Truck Drivers' Book of Rules issued by the Public Utilities Commission of Iowa, on Page 4, has this paragraph:

> "Place lighted pot torches 100 full steps ahead and behind the vehicle at least one full step out in the road, and a lighted pot torch along the side of the vehicle which others pass. In the daytime use flags instead of pot torches, except at side of vehicle."

On page 3 of the Bus Drivers Book of Rules issued by the Public Utilities Commission of Ohio, dated February 1, 1935, and the other one is also dated on the same date, it has the same regulation.

In the Iowa Motor Vehicle Laws, 1934-1935, which is marked "Amended to March 12, 1934", I read from Pages 21 and 22 as follows:

> "Chapter 83, Laws of the Forty-Fifth General Assembly, Trucks must be equipped with portable flares.
>
> "Section 1. Motor trucks and combinations thereof operating on the highways during the period from one half (½) hour after sunset to one-half (½) hour before sunrise shall at all times be equipped with portable flares which may be plainly visible for a distance of five hundred (500) feet. The operator of a motor truck or combination shall, immediately upon bringing his vehicle to a stop upon or immediately adjacent to the traveled portion of the highway at any time during the period from one half (½) hour after sunset to one-half (½) hour before sunrise, place a flare at the side of such vehicle and in plain view of all traffic, and shall maintain it in such position during the time such vehicle remains parked."

There are more of these regulations but I think this is the substance of them.

I have here a booket entitled "Motor Carrier Legislation Enacted by 78th Indiana General Assembly 1933" and reading from page 10:

"Every motor vehicle used for the carriage of passengers for hire, and every motor truck and commercial motor vehicle shall be equipped with at least two red warning flags and two brilliant-burning danger or caution signals, so constructed as to burn with a brilliant light.

While any motor vehicle used for the carriage of passengers for hire, or any motor truck or commercial motor vehicle is stopped on the traveled portion of any highway outside the corporate limits of any city or town, for a purpose other than taking on or discharging passengers or freight, or complying with traffic requirements, the operator thereof shall cause to be displayed in a prominent postion above the surface of the highway at a distance of approximately three hundred feet from such vehicle, in the direction from whence it was coming, and also in the direction in which it was proceeding, a brilliant-burning danger or caution signal, as described in section 48, if such stopping occurs between one-half hour after sunset and one-half hour before sunrise, or if the weather conditions are such as to produce low visibility, and a red warning flag if such stopping occurs at any other time."

Exhibit 27 is the letter received from Mr. Morris concerning the Iowa tests.

Exhibit 28 is one of our first open flame torches sold beginning in 1926.

Exhibit 29 is one of our second open flame burners, on which we began production in July, 1928, and on which we continued until January, 1929.

Exhibit 29 is the torch shown in the circular, Exhibit 8.

Exhibit 30 is an advertisement which correctly illustrates the torch, Exhibit 29, as it is ready for use.

We first sent out circulars and advertising matter of our Economy torch of the patent in suit in the latter part of January, 1929, the date of the road show. I distributed literature at the road show. I imagine it was around about the 16th or 20th of the month. It usually is.

The Dietz open flame torch illustrated in Exhibit 22 appeared on the market in December, 1928 or January, 1929. We first became aware of it in January, 1929, practically coincident with the time we brought out our Economy torch. To our knowledge, it did not precede our production of the Economy torch by much, if any.

The Dietz torch shown in Exhibit 23, I first knew of in August, 1929. The first I knew of the Dietz torch of Exhibit 24 was in 1934.

The McCloskey torch shown in Exhibit 26 first appeared on the market about March, 1929.

I witnessed the tests referred to in Exhibits 17 and 18. The statements of these Exhibits correctly represent what took place.

Our first sale of a flare for use as a warning signal in connection with trucks or busses was made on October 16, 1929.

CROSS EXAMINATION

That sale on October 16, 1929 was of a shortened torch, known as the Model F, made particularly for trucks.

The original arrangement with Mr. McCloskey was that he sold torches for us. The arrangement finally devolved into an arrangement when we manufactured them for him. When we originally went into the matter, we made a torch that we had developed. That torch we manufactured and he sold.

The next step was that he had outside financial help in securing the patent on the torch in his name, to market as his torch, because he was doing the selling.

Q. And then you manufactured that torch for him? A. Yes, we manufactured a certain number of those for him.

Q. Then, as I understand it, after that he made arrangements with some other manufacturer to make them for him? A. Yes, sir.

Q. And then when that happened, you continued to make that same kind of torch you had made for him? A. The same general type, although it was redesigned.

He sued us for infringement for making that torch.

The reason red lanterns are not used for truck flares is that they are not distiguishable readily from other lights on the road, such as tail lights.

The reason open flares without hoods are not used is because they go out easily.

At the Ohio test, no test was made for rain alone without wind.

It is true that when those tests were made, the first of our flares which was submitted was not accepted. Then we changed the height of the wick holder, but there was no change in the cap.

Q. It is true, is it not, that your present type flare made under the patent can be put out by dropping water or rain, if there is no wind. A. I presume a sufficient amount of water would do that.

I don't think with a downpour of water alone, the present flare made under the patent, will go out quicker than the old flare with the open wick. I have never seen that tried in comparison.

Exhibits 28 and 29 are frequently called lighted pot torches. Either of them could be fairly called a portable flare.

RE-DIRECT EXAMINATION

The McCloskey suit against us involved a patent on the self-righting feature, the weight in the bottom of the torch. The patent was declared invalid.

We patented a method of attaching the weight in the torch. We still use it.

Plaintiff's prima facie case closed.

H. R. VAN DEVENTER

My residence is New York City. I am a consulting engineer and patent attorney.

I graduated from College as an engineer in 1903, and went into telephone and construction work, and in 1905 began the manufacture of telephone apparatus. During the next 15 years, I engaged in the manufacture of small electric and mechanical devices, either in an engineering capacity or in an executive capacity responsible for manufacture. For the major portion of that time, I had responsibility for the design and construction of tools and dies and the general supervision of the manufacturing program involving mechanical and electrical devices such as telephone equipment and ignition devices for automobiles.

Later on I helped design and was one of the patentees of the Dixie magneto which became standard for aircraft for the Allies during the war.

I have had considerable experience as a consulting engineer and have testified as an expert witness in a number of patent suits.

For the past eight years, I have acted as a consulting engineer and am a licensed professional engineer in the State of New York. I am a member of various engineering societies and have contributed papers to the technical press on various engineering subjects.

I am familiar with the various types of burners for consuming fuel. A burner is a device for burning fuel or fuel vapor. You can divide them roughly into two classes—vapor burners or burners using liquid fuel and employing some fuel-feeding means, such as a wick. There are burners, which are a combination of both, such as the device involved in this suit.

The burners in which we are interested here may be of the wick type. I suppose it is almost as old as history itself. Later they developed burners in which instead of the fuel being fed to a point by a wick and there ignited, they took the fuel to some point and vaporized it, and then burned the resulting gas. In order to do that it was necessary to bring to the point of combustion a sufficient quantity of air. These burners in general can be used either for lighting or heating or both. Whether you get the maximum amount of light and the minimum amount of heat, and vice versa, depends upon a number of adjustments or a number of different things that possibly can be done to the same burner. In the case of some burners, the visibility of the emitted flame would be regulated by the amount of air you supplied the burner. That is the case with a great number of the so-called gas burners.

Some typical types of burners are oil lamps. They had a wick. They had some means of supplying the wick with air; and they usually had a chimney positioned above the wick. Then we have torches such as the plaintiff's Exhibits 3-a, -b and -c. We have the railroad torch, which in the models with which I am most familiar, is somewhat similar to the bomb type torches, plaintiff's Exhibits 28 and 29.

There is another class of torch, which at one time was in common use, which is shown in a patent to Heath.

No. 66021, dated June 25, 1867, used for lighting gas lamps in the street. City lamp lighters usually carried such lighters. They had a wick. The wick has no reference character. There is the wick tube J, wherein the wick is introduced. This is ready for the wick. The wick does not project through the rim h. It has a double wall casing having air holes for admission of air, below the point of combustion, and holes in the double casing through which flame could issue. These torches are usually pushed through the hood of the street lamp and the gas cock turned on and the gas is ignited thereby. Oil was contained in the reservoir F. These passed out of use because gas lighting passed out of use, and I expect it would be very difficult to obtain one. I tried to do so, but could not fine one.

The development of burners proceeded on, and the so called vapor burners came in. The situation in 1928, when plaintiff's patentees came in the art, was that there were available both burners of the wick tube and the fuel type in many different models, both with and without caps. When I say "cap", I mean a projecting hood to shield the flame or to become heated by the flame in order to change the wick burner into a vapor type burner, or partially change it into such a burner.

By vapor burner, I mean one having a part which is heated, which heat is transmitted to the wick in a wick type burner in order to raise the temperature of the fuel in the wick and vaporize the fuel at the point of combustion. That is what happens in the ordinary lamp.

The vapor type of burner, if it has a piece like the old student lamp had in the top of the wick, which became heated and heated the center of the wick holder down about half an inch. You recall those lamps were very economical in the use of the wick because they operated partially as a vapor burner. That is the type with the old cylinder, circular lamp.

I have read and studied the patent in suit and the file wrapper and am familiar with defendant's devices, Exhibits 3-b and 3-c, here complained of.

Analyzing the structure of the device of the patent in suit, it comprises in effect only four major elements. The first is a reservoir, marked 1 in plaintiff's Exhibit 2-a, to which I will refer. The second main element is a wick tube or holder 6, which may be in heat relation to the cap 8. The third main element is a wick within the holder. It is impositively included in the patent; we can

infer that it is there. The fourth element is a burner ca 8, which has an imperforate top and openings in its sid wall to permit the ingress of air and egress of flam Those are the four major elements of the patent.

The wick holder of the plaintiff's patent is in hea exchange relationship with the cap. The holder 6 has laterally extending flange 5, which rests upon a thread member screwed into the top of the casing 1. This sam member engages the lower threaded end of the cap 8, s that when the cap becomes heated, heat is transferre directly to the flange 5 and conducted into the tube constituting the wick holder, so that the heat is direct effective on the wick.

Exhibit C is one of the Toledo torches with a c away section. The cap here conducts the heat dow against this flange and into the metal body of the tub and thereby to the wick.

The Court:

Heats the metal body and then the wick and then th fluid in the wick?

A. And vaporizes some of that fluid that rises int the dome and mixes with the air that goes into the sma ports at the bottom, and that furnishes the ignition

Referring to plaintiff's patent in suit (Figure 1 the heat exchange just referred to takes places betwee the screw-threaded lower end of the cap and throug that to the fitting or part of the torch body marked 4 and then through the flange to the wick tube.

In the development of the art of burners, as far back as I can remember, we had the kerosene lamps, whic had a reservoir to contain the oil, a wick, and a holde for the wick, so that the upper part of the wick projected through the holder. Then there was a guard usually in the form of a chimney, placed around the wick to pre vent drafts from getting in, and the flame from getting out. That type of lamp is exemplified in the Knowles patent, No. 22,771, issued in 1859. This patent is not set up in the answer and is referred to as showing the state of the art.

The Knowles patent shows the ordinary kerosene lamp, and it has a flat metallic wick tube. The patent is so old that it was taken out before the days of kerosene, and he refers to the use of tallow and other suitable ma terial. The reason he put the flat metallic tube down into this tallow was so that it would melt the tallow. So for that reason he had to get the wick tube good and hot.

otherwise he would not get any flow of oil. So he built a heater around the upper end of the wick tube; and that heater, so far as we need to direct our attention to it, comprises the cap N, which is the cap that supports the glass chimney and that has a row of holes for the admission of air. The air comes in through the holes and thereby the flame gets enough air to make it combustible. The upper part of the cap N had a transverse slot through which the flame issued, and that gave the light. Now if we close up that slot in the top, perforated top of the cap N, and put some holes in the side of that same cap, we have substantially the structure of both defendants.

The Court:

You say that top N is perforated?

A. The top N is perforated.

The Court:

On the upper surface?

A. On the upper surface, directly on a line with the top of the wick. The slot for the light is directly above the wick. In this kerosene lamp, he had the heating element, and he had it for a very specific purpose, because he used tallow or other material which had to be heated or made quite warm in order to be fluid.

Another patent not referred to in the answer but illustrative of the prior art is that to Wenzel, No. 577,090, dated February 16, 1897. It is entitled—Safety Lamp. It says it is a safety lamp adapted for general use in a portable or stationary capacity. It describes it here for use as a pocket lamp or a night lamp. He has a reservoir or body 1. At the top of this reservoir he has a flanged wick holder, which wick holder extends through the flange. This brings the top of the wick practically in the center of an open slot which admits air all around to the flame, and this flame finds egress through the open top of the globe or shade 5. Here again we have a structure where the heat from the globe or shade 5 would be transmitted down and through the feet which support it and into the ring 4 surrounding the wick holder and into the wick; and, again, if we close up the upper opening of the globe 5 and put some openings in the side wall of 5, we have the structure of the two defendants.

These types of lamps I have just described were not used, so far as I can find out, to any extent in the open; they were as a rule used with glass shades and were de-

veloped primarily for use inside, where they would not be subjected to drafts. It gradually became the custom to use for outside lighting purposes torches like defendants' Exhibit B, which is the ordinary old style railroad torch, having a projecting wick tube and an open wick and a body filled with oil. That type slightly modified into the so-called bomb type, which meant merely leaving off the handle and putting the wick in the center, and in my opinion became the standard form of so-called construction torch in use for many years. Such a torch is shown in the McKloskey patent, No. 1,610,301. A further torch of this type is shown in the patent to Nichols, No. 1,036,514.

Exhibit B is the general type of torch at one time used quite extensively in the railway inspection work. It was also used as a construction torch. Usually the construction torches did not have this laterally extending handle. They were more of the bomb type shown in the McCloskey patent, No. 1,610,301. The telephone companies and the water companies used torches of this general type when they opened trenches in the street and did other construction work. In connection with my own work in the telephone business, I used such torches on the elevated railroad in New York. At night we used the torches of the bomb type, having the round fluid container. The railroad company preferred the use of a torch of that kind to a lantern because it seems in the railroad business the use of an ordinary lantern, either white or red, denotes a railway signal, or might denote a railway signal, and the enginemen would slow up if they saw a lantern on the structure. If they saw one of these torches, they knew then it was some construction work, and without the lantern signal they would go ahead. The only objection I ever heard raised to this type of torch was the fact that there was a fire hazard in the use of anything with an open flame. The woodwork there was saturated with oil and grease and was very inflammable.

I actually used torches of the bomb type with the reservoir, wick tube and wick extending from the wick tube for signals in connection with my own work in Brooklyn, New York in 1903. I was employed by the New York and New Jersey Telephone Company at Brooklyn, New York. I remember the date because I changed my job shortly thereafter. It is fixed definitely in my mind because I got married. The reason I happen to remember this particular torch matter is that I

had one of these torches alongside of me on the seat of a cable box. I stuck my elbow back into the torch without knowing it, and it burned me so bad I fell off the seat.

Mr. Owen:

If it will save any time, we will admit this type of torch has been in use a great many years; prior to 1903.

The Nichols patent, No. 1,036,504, exemplifies as a general type the torch of Exhibit B.

Mr. Freeman:

That is a state of the art patent.

I have a model that exemplifies the subject matter of the Wenzel patent, No. 577,090, defendants' Exhibit D.

The Wenzel patent has to do with a lamp and includes a lamp body 1, made of metal, together with a wick tube 6, positioned in the upper end of the body, which tube is connected with a horizontal or laterally-extending flange. Part of the wick tube projects up above the flange and part below it. Within this wick tube is the wick 11. Positioned above the body and in close proximity thereto is a globe or shade 5, open at its upper end and closely surrounds the upper part of the wick tube and the flame. The globe is supported on clips which project up above the body, so that there is an open space between the lower end of the globe or shade and the top of the chamber. The air entering within the shade through this open slot passes upwardly and out of the top, so that this shade in effect is an open-ended cap, the slot at the bottom permitting the air to enter so that the flame can get air and the burning flame issuing from the top. The plate to which this wick tube 6 is secured really forms the lower part of the chamber or container around the upper part of the wick, so that there are openings above this plate through which air is admitted. In place of having the openings at the side of this globe, as is found in the Withrow and Close patent, Wenzel provides an open top, and when you open the top, the flame can escape; then you do not need the openings on the side.

This Wenzel patent has the main elements found in the Withrow and Close patent, that is the reservoir body and a wick tube positioned in the upper end of the body, with a wick therein, and the shade mounted on the upper end of the body and surrounding the upper end of the wick tube.

In the closing of the top as found in the Withrow patent, you have to put openings in the side; so we go to the prior art and find out about these caps. You selected a cap here depending upon what you wanted to do with it.

You will find in the Blake patent, No. 453,333, a hydrocarbon burner, which has a cap, which he terms a shield C. This shield has a base, C', which is perforated to admit air freely into the shield from below, and its cylindrical wall is pierced by apertures C-2; and Blake says this

> "The shield entirely encircles the burner tip and is closed at the top, and has the apertures c-2, which are radially in line with the apertures b-3 in the burner tip B. The apertures c-2, however, are very much larger than the orifices b-3."

I will say in parentheses there he is talking about a gas burner.

The Court:

What is the fuel here, gas?

A. Gas; the only part which particularly concerns us is the cap which has means for admitting air at the bottom, and orifices at the top through which the flame can find exit. We do not need the bottom closure on the cap because we have something here which will act just as well. But if I take this cap and put the flame-emitting orifices on the side and close the top, we have the device with a cap surrounding the wick tube and air ports at the bottom of the cap for admitting air, and holes in the side walls of the cap to emit the flame.

I am combining Blake and Wenzel.

Another cap patent is that to Kahn, No. 1,175,327. This patent is entitled "Hood for Flash Igniters" and is a type of hood or cap which came into extended commercial use. The patent shows a gas supply head, and the hood elements, which the patent says are designed to encase any type of head, comprise a spider 2 in the form of a circular disc, having a central aperture therein combined with a down-turned flange 2' for engagement with the head, and the upper portion or cap proper, 6', which has in it the perforations 7 and 8 for emitting the flame. That cap, comprised of two pieces, Figs. 2 and 3, if made as shown in the drawing, can, without change, be set on top of the gas supply head or the equivalent, which is the wick tube of Wenzel, to form the complete torch bur-

ing the protecting cap or hood surrounding the burner flame.

The Court:

Just what was that device for? That was merely a lighting device?

A. The Kahn patent is used in gas stoves, where you have a continuously burning pilot light. You press a button and the amount of flow in the gas jet is increased, and flame jets forth as shown in Figure 1, and the other burners being turned on in the stove, it ignites them.

Another patent in this cap group is that to Heston, No. 270,587. It shows a vapor burner, by which he means a gas burner. The cap is shown at C and really comprises two members, one within the other, and one adjustably mounted relative to the other, with a row of top and bottom holes, the bottom holes being for air and the top holes being for the flame exit. By adjusting these caps relatively you could vary the position of the holes to meet various conditions of flame. In other words, this is an adjustable cap. That cap can be used on the Wenzel model in the same manner as the Blake and Kahn caps.

I have a cap here, Exhibit E, which I have made as an attachment to the burner, Exhibit D, which has a closed or imperforate top refegred to in some of the claims of the patent in suit; but likewise the patents to Blake and Kahn and Heston all show caps with imperforate tops.

The torch, plaintiff's Exhibit 28, heretofore manufactured by the plaintiff company has an upwardly extending portion forming the upper end of the wick tube, extending vertically about one inch above the body of the torch. To merely lift off the cap C of the Blake patent and place it on this wick tube, you will then have a torch having about the upper end of the wick a cap having an imperforate top and having holes in it for admission of air to the intrior of the cap and another set of holes through which the flame can find egress. You would have with this particular model, Exhibit 28, a torch that would be much nearer the defendants' structures than it would be to the Withrow patented disclosure; for in order to distinguish that patent from the prior art and from the structure that would result by combining this old torch with the old cap of Blake, it is necessary to say that the cap is mounted directly upon the body of the torch; for if you extend the wick tube

upwardly and then mount the cap on the wick tube, all you have is a combination of the old torch in Blake or a combination of Wenzel and Blake or a combination of certain other patents to which I will later refer and Blake, or Kahn or Heston.

The Wenzel model, defendants' Exhibit D, will serve excellently as a signal for a torch or flare for giving illumination. I have witnessed that model tested in comparison with plaintiff's and defendants' torches. It gives a good visible flame. I did not make any tests on it with a meter, but it would appear to the eye to be about the average of the three torches here, plaintiff's Exhibit 3-a, 3-b and 3-c. There was considerable wind blowing at the time during part of this test. This torch did not go out. We gave it a water test. It stood up about as well as some of the other torches tested. I would say it would be perfectly satisfactory under average working conditions in comparison with most of the torches now in use for the purpose of signaling.

This Exhibit D includes the metal cap.

The Court:

When you tested it, did it have on the open top metal cap or have the combination of one of these others?

A. Both, your Honor.

The Court:

Both worked the same?

A. Both worked excellently. The closed cap under some conditions would be preferable.

The Court:

That is the closed top?

A. The closed top.

Martine, No. 35,349, is a state of the art patent. Martine desired to secure greater efficiency of combustion and thus a better flame. He provided on the upper end of his wick tube B, which projects upwardly some distance from the reservoir A, a sheet metal tube-like device which is open at its bottom and top. This device or cap was secured to the wick holder B by a plurality of fingers, which project downwardly from the cap and are secured to the wick tube, and openings are provided in the side walls of the cap. So in Martine, we have a serervoir body, a flange to which the wick tube B is secured, and the upwardly extending wick tube of the Withrow patent, surrounding the upper end of the wick, and the wick tube is the guard referred to as the metal

tube C in the Martine patent, the equivalent of the cap referred to in Withrow. The purpose of the guard or cap C, so Martine says, is to give a better light, in that it becomes hot and assists in consuming gases which would otherwise escape by imperfect combustin.

The Court:

That is a kerosene lamp?

A. Kerosene is mentioned in the specifications. The tube C of Martine is referred to as extending above the top of the wick tube and surrounding the lower part of the flame. Martine discloses everything of the Withrow and Close patent, except the imperforate top on the cap. If you take this patent, Figure 1, and imagine that you have got a silver dollar and lay it across the top of the cap C so as to make the top wall of this cap imperforate, you then have substantially the structure shown in the Withrow patent. Martine in this respect is much closer to the defendants' device than is the defendants' device to the Withrow patent, but Martine is not as efficient so far as the heat transferred to the body of the torch is concerned; that is what Withrow did when he put the imperforate cap down directly in contact with the body of the torch.

I call attention to plaintiff's Exhibit 3-b, the Bolser torch, and will now proceed to remove from the wick tube of this torch the entire cap. Looking at the drawing in the Martine patent, it will be perfectly evident that we have before us in this Exhibit 3-b, the reservoir A of Martine plus the wick tube B and the cap which I have removed from the Bolser device may be the cap of Blake or Kahn or Heston; and that it mounts upon the wick tube and not upon the body of the torch. That is in my opinion a very important distinction to which I draw special attention.

There is a mettalic connection from the guard to the wick tube B in the Martine patent. There would be some heat transfer by conduction from the guard to the wick tube, the degree being entirely a matter of choice; that is to say the degree of heat transferred. You could make these supporting legs A thick or thin and you could make the entire cap out of copper, thereby greatly increasing its conductivity as compared with iron; and you could do several other things, all of which are within the scope and experience of any one skilled in the art to do.

The patents to which I have been referring have to do with those without an imperforate cap or top. There

are a good many patents in the prior art, which provide burners with closed covers and wherein the flame is permitted to escape through side openings. In practically all good vapor burners, there is a closed top, and whenever you close the top, it follows that by necessity there must be flame exit openings somewhere else, and since flame and heat travel upwardly, these openings are usually made in the side wall of the cap near the top.

In addition to the Blake and Kahn and Heston patents to which I have previously referred, I call attention to the Reekie patent, No. 192,130. This shows a burner primarily designed for heating and using gasoline or the like. It has a wick tube A, and spaced apart from this wick is the burner proper, which consists of a circular member forming a chamber in communication with the wick, and having a row of perforations around the bottom for the inlet of air, and another set of perforations around the top of the chamber for the flame exit. Reekie says that sufficient heat being obtained to vaporize the fluid, gas issues into the chamber G, where it is ignited and finds an exit beneath the deflector, the deflector being the closed or imperforate top H of this chamber, the chamber member forming in reality an integral cap similar to the caps I have heretofore discussed. He says that the core, referring to the part that I have called a chamber with its air inlets and deflector acts very much like a blow pipe and produces an intense and quick heat, the purpose of this specific patent being to make a heater out of the burner. The Reekie device is of interest as showing one thing which is not altogether clear at first sight, and that is that the wick in most of these devices is merely a means of conveying fuel in the burner to a point at which you want to burn it. The Reekie device is arranged in a horizontal plane. That is instead of the supply of fuel being below the burner proper, it is at the side of the burner. In that respect, Reekie differs from the torches we have been discussing.

There are other patents, which show this imperforate top, such as the patent to Nelson, No. 1,077,364. If you remove the pressing iron illustrated in Figure 1 of the Reekie patent, the flame would be visible, and the nature and extent of this flame would be entirely dependent upon the proportions you gave the air and fuel holes. You could make this type of burner either as an illuminating burner or a heating burner, at will, and in

very many cases, burners of this identical description have been used for both lighting and heating. One case with which many of us are familiar is the ordinary hot dog stand at the circus, where they have a gasoline burner of this type hanging up on the side wall, and gives light, and when he gets an extraordinary rush of customers, he takes the same burner down off the nail and sticks it under a big pan of hot dogs. I have seen several of these gasoline burners of this type that work at the same time as heaters. It may be that by adjusting the gasoline feed, he can get more light when he needs light, and more heat and less light when he needs heat, because it is entirely a question of air adjustment or fuel adjustment or both.

A further illustration of the imperforate top feature is found in the Almond patent, No. 193,796, entitled "Vapor Burners for Heating Purposes." Almond provides a lamp reservoir, the body A. A wick tube is mounted within this body and projects upwardly therefrom. On the upper end of this wick tube is an enclosure member or cap. This cap has an imperforate top and is provided with flame exit openings and below the flame exit openings are air inlet openings. The draftsman making the patent attempted to describe the flame which encircles and surrounds the burner proper. There is also provided in the Almond patent an outer guard and supporting members for supporting the vessel or the like, which is adapted to be heated. This showing somewhat confuses the drawings, and it is not easy to visualize the burner per se. In order to clearly see the parts with the flame removed, I have made a drawing which is an enlarged photostat of Figure 1 of the Almond patent drawing.

The Court:

What makes you say that is a closed top?

A. It is completely closed, the top of the cap, if Your Honor please, I think you are looking at the outside top here. The outside extreme vertical top of the drawing is merely the outside shade, which has nothing to do with the burner proper. The draftsman tried to show the flame issuing from the burner proper, and then he put a shade outside of it full of little perforations.

The Court:

You claim this is the device right here.

A. That is the complete device. By removing the flame injecting parts and the outside guard, which has

nothing to do with the burner, we have left the burner proper, which includes the tube-like structure enclosed at both ends, and provides flame exit openings at the side walls and also air inlet openings. This burner of Almond includes an overhanging skirt which extends around the air inlet openings. As to the skirt, Almond differs from the Withrow and Close patent. The skirt is the bottom element here that goes around the piece with the holes in it. In the Withrow patent, the air enters the cap horizontally. In Almond, the air first goes upwardly between the downwardly-depending skirt and the wall of the bottom perforated portion of the cap, and then goes in laterally. When the air finally gets into the cap in Almond, it goes in and reaches in the same manner and functions in exactly the same way as it does in Withrow; but it goes through a little different path to get there.

Almond also differs from the Withrow patent in providing the burner head spaced a distance above the body of the torch or lamp. In this respect, that is the mounting of the burner upon the upper end of the wax tube, spaced above the lamp body, it corresponds with defendants' structure here charged to infringe. The two differences in Almond and the Withrow and Close patent are in the overhanging skirt and the arrangement of the burner spaced high above the torch body.

I have here a burner, defendants' Exhibit G, made according to the Almond patent. I have mounted the burner on a torch body like the devices charged to infringe. I have burned this burner and I find from these tests, there is no substantial difference between the operation of this burner and the burners of the two defendants in suit. Your Honor will understand that the dimensions of the holes, whether they are large or small, is a matter of choice. There is no formula of which I am aware whereby the diameter of the air holes, the diameter of the flame holes, can be calculated. These practical men in this art evidently arrived at the size of the holes that they used, the volumetric capacity of the cap, by purely empirical methods. They tried out something. If it did not work, they made the holes a little larger or smaller and moved them about, and finally they got what they thought to be the best results for the average operating conditions. The average operating conditions in a device of this character are very hard to determine

What would work very nicely under one set of conditions with one wick adjustment, with one given oil, might not operate satisfactorily at all under another set of conditions. So the size of the holes that they made in these caps is nothing that involved the question of discovery. The perforations in the caps of the Almond patent may be and probably are just as good for one certain class of use as the perforations in the Withrow patent that came along years afterwards.

This was substantially the state of the art when Withrow came into it. We had two general types of burners. In one, the burner head or cap was mounted directly on the body of the torch, and in the other, the burner cap and head was mounted on a neck, which extended upwardly and raised the whole burner head away from the body of the torch. And on these two general types of burners, you could use at will any kind of cap of your own selection, depending upon what you wanted to do, whether you wanted a heater or whether you wanted a burner to produce a flame, you could pick out a cap and put it on.

Referring to defendants' Exhibits H and I and to the references already made to the down-turned skirt on them, Exhibit H is merely the commercial burner head of the defendant Bolser, and this ring that has been placed over this burner head to cover up the lower row of holes is the skirt that I have been talking about in connection with the Almond patent; so that the air enters vertically into the annular space around the cap, and then goes in horizontally. Defendant's Exhibit I is also the Bolser cap with the skirt permanently soldered thereto, and a portion of the model being cut away to show how the air finds entrance to the interior of the cap. The skirt does not cover the openings in the sense that it closes them; it is spaced apart so that there is a free, open, annular space between the inner wall of the skirt and the outer wall of the cap, and the air holes open into this annular space.

The Almond patent, page 1, third from the last paragraph says in regard to the top of the burner being closed:

> "The upper end of the tube H is closed by a hinged cap, I, which can be swung open by hand or by raising the plate f against it."

On the model, Exhibit G, the plate referred to is the extreme top of the complete cap hinged to be thrown back or put down at will, just like the lid of a box.

I now operate the hinged imperforate top of the cap on defendants' Exhibit Torch, Exhibit G. I actually brned oil in the defendants' torch, Exhibit G. It operates very nicely, burns very steadily, and apparently so far as the tests went, is equal in performance to the commercial torches of the defendants.

I operated defendants' flare with the down-turned skirt represented by defendants' Exhibits H and I.

Defendants' Exhibit J is the torch with the skirt or overhanging flange secured to the burner, referred to as having operated with the skirt or overhanging flange secured to the burner.

In connection with the burning of the torch, defendants' Exhibit J and comparison with the Almond model, defendants' Exhibit G, and with plaintiff's Exhibit 3-b, I observe practically no difference. The presence of the skirt over the air holes did not make any difference in the tests that I performed. The skirt might afford some protection in case of very high wind; but the advantages of it are doubtful and I see no particular reason why it should be used. Its presence, however, makes no difference. If anything, it might be slightly beneficial, but not enough to be commercially worth while.

As to my observations as to where the flame found exit in defendnats' Exhibit G, defendants' Exhibit J, and plaintiff's Exhibit 3-b, if these torches are burned in absolutely still air, they get very hot. The interior of the cap becomes so filled with gas that the flames will and do extend out of the air holes, as well as the flame vent holes, and if that heat is continued long enough, and the torch has been filled full of oil, the oil will begin to come out of the wick tube and run down on the outside of the torch. How much heat it takes to bring the flame out of the bottom air holes, I do not know. How long you would have to burn the torch, I do not know. It would depend upon how tight the wick was packed, and how much of it was exposed in the cap. There are so many variables that from an engineering standpoint, you cannot arrive at definite conclusions. You can not state definitely when a certain thing is going to happen with these torches, but if you let one of them get hot enough, the flame will come out both sets of the holes.

that is the lower row of holes termed the air holes, as well as the upper row of holes. It was my observation when burning plaintiff's torch, as exemplified by plaintiff's Exhibit 3-a, that the same condition applied. I found flame coming from the lower holes as well as the upper holes.

I have here the file wrapper of the Close and Withrow patent and find that there was an Office Action in the case, July 24, 1929, in which the Examiner cited Hathaway, No. 147,496, and rejected Claim 2 of this patent. The remaining claims in the case were allowed, the case having been filed with Claims 1 to 10 inclusive. This patent to Hathaway was the only patent cited by the Patent Office during the prosecution of this case. On September 9, 1929, the attorneys made an amendment. They amended Claims 1 and 2 and added Claims 11 to 14, and in this amendment the following appears:

> "This action is believed to place the case in condition for allowance. At a recent oral interview with the primary examiner in charge of this application, proposal to amend Claim 2 as above and add Claims 11 to 14, was considered, for reasons stated above, to avoid Hathaway and other patents inspected during the conference, including" - - -

and then the attorney listed all the other patents which appear in the file wrapper. I don't know what went on in the oral interview referred to, but I do know that the patents that were brought into this case by this amendment were like the flowers that bloom in the spring. They have nothing to do with the case in comparison with the patents which I have previously discussed as relating to this art.

The Almond, Martine and Wenzel patents were not referred to by the Patent Office or by Counsel during the prosecution of the patent in suit.

I can not read Claim 1, which has been relied upon as against the Kari-Keen flare, but not as against the Bolser flare, on the Kari-Keen device, unless at the same time, I read it on the prior art patents. I will illustrate what I mean. We find in Claim 1

> "a torch body having an opening at its upper end."

The torch body is nothing more than a reservoir adapted to contain fuel. In Almond, for example, there is a reservoir for a coal oil lamp, and I have mentioned many other patents in which reservoirs are shown. The reservoir of Almond is the same as the reservoir of defendant's device, so if this element just mentioned reads on defendants' device, it likewise reads on the prior art.

The torch body is referred to as having an opening in its upper end. Defendants' device does have an opening in its upper end, in the center. So has the Almond device and many other devices of the prior art, which I have referred to.

The next element of the claim is

> "a wick-receiving tube extending into said opening."

If the wick-receiving tube of defendants' device actually extends into the opening, then also the wick receiving tube of Almond extends into the opening. Both Almond and the defendants' device have wick receiving tubes, which are in communication with the opening, so that when a wick is mounted within the tube, a part of the wick may extend up above the wick tube, and part is within the oil inside of the bottom.

The claim further reads

> "and a cap disposed on the outer side of said torch body to enclose the outer end of the wick."

As I have already stated, in defendants' commercial device, plaintiff's Exhibit 3-c, a cap is mounted on the wick tube; that is, it is entirely supported on the wick tube, and through the wick tube supported on the torch body; it is not actually connected to or mounted on the torch body.

I think it is important to consider just what is meant by the word "disposed". Webster says that "disposed" in its present tense means "to place". It is an intransitive verb; so that the phrase I have just quoted would read, if expressed in other language.

"a cap placed on the outer side of the torch body" and the only way that that element of the claim can be distinguished from the prior art, for example the Almond patent, in order to give validity to the claim, is to read it just that way,—that the cap is placed on and directly supported by the torch body,—and if given that

nterpretation then the Exhibit 3-c does not have that element at all. If the term

"a cap disposed on the outer side of the torch body"

means or is interpreted to include mounting the cap on the wick tube,—and it must be so interpreted, in order to read on defendants' commercial device, Exhibit 3-c, then likewise we find in the Almond patent, a cap entirely supported on the wick tube or wick holder.

The claim further includes:

"said cap having an imperforate upper wall."

From an inspection of Almond, it will be noted that the upper wall of the burner cap is imperforate; it has no opening in it. The same thing is true of the defendants' device.

The claim further reads:

"lateral flame openings, and air openings below the flame openings."

This refers to two series of openings, one to admit air within the burner, and the other to permit the exit of flame. And in defendants' device, we have in the side wall of the cap, Exhibit 3-c two series of such openings, with the air openings below the flame openings. But likewise we have in the Almond patent in the vertical side walls of the cap, a series of air inlet openings, which are below larger openings formed in the side wall above; so that we have in Almond the same arrangement of elements that we have in the defendants' commercial device, Exhibit 3-c.

The only way that I can read Claim 1 upon defendants' device is to read the term

"a cap disposed on the outer side of said torch body"

to mean a cap disposed on the outer side of said torch body or on a wick tube mounted on the outer side of the torch body, and if I read the phrase to include the part last mentioned:

"on a wick tube mounted on the outer side of the torch body"

hen we have a wick tube having a cap connected thereto n exactly the same manner as is found in defendants'

commercial device and also in the prior art. If you read Claim 1 to mean just what it says:

> "a cap disposed on the outer side of said torch body"

and thus distinguish it from a device where a cap is mounted on a wick tube, in order to distinguish it from Almond, then the same distinction exists when attempting to read Claim 1 upon defendants' commercial device, and defendants do not infringe the claim. If I am to read Claim 1 on defendants' commercial device, I can not do so without also reading it on the Almond device, and I therefore cannot read Claim 1 on defendant's commercial structure, Exhibit 3-c, without also reading it on the prior art.

I do not find in defendants' structure:

> "a cap disposed on the outer side of said torch body to enclose the outer end of the wick."

I take it this cap so disposed to enclose the outer end of the wick means cap 8 shown in the Withrow patent, for example, mounted on the top of the torch body 1, and serving to enclose the wick. Defendants' cap is disposed on the outer end of the wick tube above the torch body and not on the bottom. This is a different arrangement from that shown in the drawings of the patent in suit, and the claim can not be read to cover the different arrangements used by defendants without reading it directly upon the Almond patent and the other prior art to which I have referred, many of which patents show caps disposed on the outer end of the wick tube above the torch body.

As to Claim 2, which has been relied on against the commercial flare of Kari-Keen, Exhibit 3-c, and likewise against the Bolser flare, Exhibit 3-b, what I have said with respect to Claim 1 applies with equal force to Claim 2 as applied to the torches shown in Exhibits 2-b and 2-c. One of the elements of Claim 2 is:

> "a flame guard for said wick mounted on the outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports."

The drawings show this to be the guard 7, which we have heretofore referred to as the cap. This is not mounted

on the outside of the torch body 1; it is mounted upon the upwardly extending neck of the wick holder 6. Turning to Exhibit 2-a, which is Figure 3 of the patent in suit, this can be fairly read upon the claim, and the meaning of the term:

> "a flame guard for said wick mounted on the outside of said torch body"

will immediately be apparent. In this Figure 3 of the patent, the guard 7 is shown screwed into a flange, which really forms part of the torch body; it at least is something not spaced apart therefrom; and this cap or flame guard 7 is directly in contact and heat relation with the flange 5 of the wick tube.

Now turning to Exhibits 2-b and 2-c, showing defendants' devices, it will be seen that the flame guard or cap 7 is not in contact with the body 1 of the torch, and is not in contact with the laterally-extending flange 5 of the wick tube, and is not in heat relation thereto, except to the extent that in any device made of metal, the various parts are in heat transfer relationship. In plaintiff's device, they had a definite reason for locating the cap where they did. In defendants' device, they also had a definite reason for locating the cap where they did. Claim 2 can not be read on either of the defendants' structures, because if you do, you read it squarely on the Almond patent.

Comparing Claim 11 with the defendants' torches, plaintiff's Exhibits 3-b and 3-c, one of the elements of Claim 11 is:

> "a wick holder having a portion in contact with the wick and a supporting and heat receiving flange."

In the patent in suit, a structure is shown to which this language can be applied and mean something: as the wick holder 6 of the patent has a portion in contact with the wick and has a supporting and heat receiving flange 5. When we read "heat receiving", we naturally have got to find out where the flange receives the heat, and if we keep in mind that the means of the claim, which is the cap 7, gets very hot when the torch is in operation, it will be apparent that the heat from this hot cap will flow down to the flange 5, which is in heat receiving relation thereto, and which also supports the wick; and

that the heat is carried from the cap 7 across the flange and into the wick, vaporizing the oil.

Now lets us turn to plaintiff's Exhibits 2-b and 2-c and look at the caps 7 shown therein. Immediately a wide distinction in respect to the heat transfer will be seen, for neither of the flanges 5 of defendants' structures are in heat receiving relation to the cap 7. The caps 7 of the defendants are mounted on the top of the wick tube, and the wick tube right at the top receives the heat from these caps. The flange 5 in the defendants' structure works exactly backwards from the flange 5 in plaintiff's structure and patent. In the plaintiff's structure and patent, the heat flows in from the outside of the flange to the wick. In defendants' structures, if the heat flows anywhere through this flange, it flows outwardly from the wick through the flange to the body of the torch and to the oil therein. The direction of heat flow in defendants' devices is exactly opposite, if any heat flow takes place, to the path of the heat flow in the plaintiff's device and patent, and the flange 5 in defendant's structures is not in heat-receiving relationship to the cap 7, except insomuch as all parts of a metal structure are in one way or another in heat transfer relationship to each other.

The heat flow relationship of both defendants' commercial torches compares identically with the heat transfer relationship of the Almond patent, No. 193,796.

As to Claim 5, unless you read:

"means to hold the wick in place"

as referring to holding it in the opening in the torch body, it reads directly on Almond. You must also in connection with that element of the claim, read the cap as fitting over the wick holder, and that means to hold the wick in place, serving as a complete enclosure for the wick, except only for the side flame and air holes. If you read the claim without regard to the patent drawings of Withrow, then you read it on Almond, and this defendants' commercial device does not infringe.

I have attempted to read all of the claims of the patent in suit on the torches made by the defendants, and am unable to do so without encountering the prior art. If the claims are read so that they read on the defendants' structure, then they also read on the prior art.

CROSS EXAMINATION

By Mr. Owen:

Q. Did you make any independent search for patent references in connection with this case? A. I did.

Q. Where did you make that? A. In my office and in the Public Library in the City of New York, which has a complete file of all United States patents.

Q. Before you made that search you had all of the referernces submitted to you that were cited in the answer? A. I did not.

Q. You made an independent search and then had those references submitted later? A. I had some of them and some of them I did not have until after my search had been completed.

Q. When did you make your search? A. I think it was in March.

Q. Of this year. A. Yes sir.

Q. How long have you known of these patents which you have brought in as representative of the state of the art? A. Not prior to February of this year.

Q. You knew them at the time? A. Some of them.

Q. When did you know of the last of them? A. I would have too look up my correspondence from counsel.

Q. Several weeks ago? A. I don't think it was longer than three to four weeks ago. I would have to refresh my memory. I can do so if you wish.

Q. It was three or four weeks at least? A. I think so.

Q. Were the patents you brought in as representing the state of the art those discovered by you in your search? A. They were not.

Q. They were submitted to you by counsel? A. Yes sir.

Q. You did not discover any additional patents that you have referred to? A. Nothing as pertinent as the art here discussed.

Q. You have recited your own experience in using torches such as Defendants' Exhibit B? A. I have.

Q. And you actually used those? A. I did.

Q. How long ago did you first know of such torches being in use? A. About 1903.

Q. How long ago did you first know of torches similar to Plaintiff's Exhibit No. 28 being in use? A. You

mean as to the general type or as to that particular physical structure? A. As to the general type?

A. I would say 1912 or 1913; sometime before the world war.

Q. Were they extensively used at that time? A. I don't know. I used them. They were a common article of commerce because I bought them and used them at that time.

Q. And where did you use them, under what circumstances? A. Installing machinery and doing work of that kind. We wanted torches to run with by night, instead of running the electric light plant; we bought some of these. I recall buying six of them; not this structure, but this exposed torch.

Q. That was used inside the building? A. Inside and outside also. This torch, I might interject, is substantially the old campaign torch of the election day parade. They had a pole a man carried in his hand or over his shoulder, and the body of the torch was swung in a yoke so that the torch would hang this way regardless of the position of the pole. I can remember that torch being used extensively outside in such parades and by circuses, for a period extending back to Benjamin Harrison's election, whenever that was.

Q. I understood you to give four classes of these torches or flares or whatever you might call them. The first class you gave was oil lamps with wicks? A. That could be one class.

Q. Do you recall the four classes you gave? A. I said I thought you could divide the class of burners up into classifications; and that an oil lamp having a wick would exemplify one type. That has a chimney. And you have an open wick torch of this type, Defendants' Exhibit B. We have the vapor torch, which has no wick. Then you have the combination of both the vapor and wick type, which is exemplified by the model of the Almond Patent, Defendants' Exhibit C.

Q. Do you know of any other illustrations in the art of this combination vapor and wick type? A. I think there are some shown in these patents that we have discussed (refers to book); if not, I shall refer to other patents which show them. The patent to Warner, 85,297, shows a vapor lamp employing a wick; a downwardly extending tube 11, was filled with a substantially round wick 12. That wick conducts the liquid fuel to the

top of the burner, which top has an upper end provided with two beads or enlargements 13 and 14. In these beads jet perforations 15 are formed. The top of this cap, as shown in 16, is imperforate. That is a type of burner which is a vapor burner employing a wick.

Q. Do you understand that the wick 12 does anything more than convey the oil up into the vaporizing chamber in this Warner structure? A. That is all; and my understanding is that is all any wick does unless you burn the wick.

Q. You do not understand that this wick 12 is burned, do you, or lighted; that is, the flame is not lighted at the wick 12? A. No, sir.

Q. Do you know of any other instance in the prior art where the wick which conveys the fuel to the vaporizing chamber is lighted so that the flame burns from the wick? A. Yes, the patent to Almond, 193,796.

Q. That is the one you referred to? A. Yes; and the patent to Billingham, 181,030; the patent to Heath, 66,021; patent to Martine, 35,349. Martine says that the cap C retains the heat and assists in consuming the smoke and gases.

Q. That reference is what? A. 35,349.

Q. That is one of your state of the art references? A. Yes sir.

Q. This patent to Martine does not show any vapor escaping through the holes and ignited at that point, does it? A. Ignited outside the holes?

Q. Yes? A. It would depend upon the conditions under which the lamp was burning.

Q. I am asking you what the patent shows? A. The patent does not show any vapor anywhere.

Q. The patent shows a flame extending directly up? A. It does.

Q. It does not show any flame on the outside of the shield C? A. It does not.

Q. The patent to Heath does not show the flame? A. Will you give me the number of that patent?

Q. 66,021? A. It does not. The patent says that the wick tube j has a wick introduced in the ordinary manner.

Q. And that patent does not state that there is any escape of gas from the openings in the tube, does it, where it would beignited? A. It does not; but any one who has seen these lighting torches in operation knows

that the flame does escape, and that it is visible. I have seen such torches and I know a visible flame escaped from the side holes in the torch.

Q. Where did you see that torch? A. I Wilmington, Delaware; and the City of Philadelphia, Pennsylvania.

Q. Was that constructed in accordance with the Heath Patent? A. I don't know. It was that general type of torch used by all lamp lighters of that period.

Q. Did you ever see the torch of the Billingham patent in operation? A. I have seen torchse of this general description in operation, but whether they had all the features disclosed in the Billingham Patent or not I am unable to state. All of these torches had as a rule an air inlet below the flame or wick and the flame exit holes in the casing at some point in the cap above the wick. The Billingham Patent says on the second page thereof:

> "To light a street lamp: The cock of the same having been opened to allow of the supply of gas to the burner, the openings or perforations h are brought into proximity with the burner, and the flame, issuing through these perforations h, and deflected by the disk of metal i, lights or ignites the gas. As previously stated, air is supplied to to the lighted wick through the perforations d, and combustion is thus maintained."

Q. Did you make any effort to secure one of these Billingham Torches? A. I tried to secure a street lighting torch, but I was unable to do so.

Q. With whom did you communicate in that connection? A. I sent a man down to the New York Gas Company. He was unable to locate any of the torches.

Q. You did not get in touch with the owners of the Billingham Patent? A. I did not.

Q. Of all the patents that you have considered in this connection, which would you select as the one which most closely approximates that of the structure of the patent in suit? A. If you refer to the Withrow Patent as showing a cap mounted on the body of the torch. I would say we have no patent in the record that shows that feature. If you refer to the Withrow patent as showing a burner head carried on a torch body, in the manner exemplified by defendants' exhibits, or, rather defendants' structures, that are alleged to infringe, then

I would say you have almost a photographic copy of these structures in the Almond Patent of record.

Q. In referring to this Almond Patent, did you construct a device in accordance with the drawings of that patent? A. I have had one constructed.

Q. Is it here? A. It is Defendants' Exhibit G, with the necessary changes in the flange to adapt it to the torch body.

Q. You state that that Exhibit G is your best effort to reproduce the construction of the Almond Patent? A. Within the limits necessary for a model for the purposes of this suit.

Q. Is this the only one you constructed? A. There is another model, which I now produce, which is Defendants' Exhibit J.

The Court:

That is on the Almond Patent?

A. That is defendants' torch with the skirt of the Almond Patent. The burner head is substantially the Almond burner head.

The Court:

What is that, Defendants' Exhibit what?

Mr. Owen:

Defendants' Exhibit J; and the other one was Defendants' Exhibit G.

Q. Then you made no attempt to reconstruct the Almond device for the purposes for which the Almond Patent disclosed? A. No. I did not want a heating burner; I wanted a lighting burner.

Q. In this Almond Patent, would it be possible to remove the burner, such as you have done in this folded illustration of the Almond device—what Exhibit is that?

The Court:

Defendants' Exhibit F.

Q. —would it be possible to construct that lower part of that burner, which is shown below the fold, without tearing the device apart? A. Surely. It is within the ordinary skill of a mechanic to put in a bushing, thread it and screw it into the body.

Q. In the Almond Patent, does not the shield G—is it not described as secured to the part or block marked E? A. It is; but that has nothing to do with supporting the wick tube.

Q. Is not that shield G also described as being secured to the flange g of the hood or burner portion? A. Yes, sir.

Q. So that in operation as Almond intended this apparatus to be used, this part G, that shield G, was not removable? A. I don't know whether he intended it to be so or not, but it is. It performs no function whatever in supporting the wick tube or burner head. Whether you use it or not is a matter of choice depending upon what you want to use the lamp for.

Q. Is there anything in the Almond Patent which suggests the possibility of removing that shield G and still have an operating structure? A. I think not. I should not think the patentee would have encumbered the patent with it.

Q. Now, Mr. Van Deventer, if you will answer my questions, we will get along much better. A. There is nothing in the patent.

Q. The patent states in the paragraph immediately preceding the claims:

> "Experience has shown me that without the tube G the degree of combustion and good-heating-flame will not be obtained."

The Court:

Where are you reading from?

Mr. Owen:

From the Almond Patent, the paragraph immediately preceding the claims, on page 2.

Q. That is true, is it not? A. Yes, sir.

Q. And you have, in getting up your so-called representations of the Almond device, entirely omitted that tube G, have you not? A. I have because I wanted an imperfect combustion, that is to say, less perfect combustion than would be obtained perhaps with the shield G.

Q. That is, you wanted to produce a result that Almond had not contemplated? A. I don't know what he contemplated.

Q. Reading his patent, I am asking you whether you wanted to produce a result other than that contemplated by the description given in his patent? A. There is no description of luminosity with respect to this vapor burner; but I never saw any flame that did not possess some degree of luminosity, the amount of luminosity in a burner of this type being dependent upon the relative adjustment of the air and the fuel.

Q. Is there any means of adjustment of air and fuel in this Almond Patent, as illustrated in the patent

drawings or as described in the specifications, to indicate that there can be any regulation or adjustment of air and fuel? A. Certainly. He moves his wick up and down, the same as defendants and plaintiff here do in their torches.

Q. That is the only adjustment? A. That is all.

Q. He cannot regulate the size of the openings? A. He fixes those for the best general average working conditions, as all manufacturers do.

Q. And the manufacturers fix those dimensions so as to obtain the results desired, do they not? A. Yes sir.

Q. You never tried this Almond device made up in accordance with the patent drawings, did you, completely? A. No sir.

Q. You never attempted to try them that-way? A. No sir.

Q. Did you prepare the drawings from which Exhibits G and J were made? A. I did not. I checked them and approved them.

Q. Who prepared the drawings? A. I don't know.

Q. How did they come into your hands? A. They were handed me by counsel.

Q. Then you do not know who made them or who determined the dimensions, the size of the holes and otherwise? A. I requested counsel to have them made and told counsel what I wanted, and I believe that these were made in the factory of one of the defendants, but which one I do not know.

Q. In telling counsel what you wanted made according to Almond, did you give them dimensions or tell them what results you wanted to obtain? A. I told them I wanted them to make me a burner head embodying an imperforate cap, a cap with an imperforate top as shown in the Almond Patent, and with flame openings in the side walls, and with air openings below the skirt.

Q. Did you say anything about the relative sizes of the openings? A. I did not because that was a matter of common knowledge in the art.

Q. That is, you wanted them to produce from the showing of the Almond Patent a structure that would perform in an entirely different manner than that disclosed in the Almond Patent; is that true? A. No sir.

Q. It is not true? A. No sir.

Q. Then what did you want them to produce? A. I wanted them to take the Almond structure, the physical structure embodying a wick tube and cap having an imperforate top, and, by the exercise of the knowledge which is common in this art, to produce a lighting burner instead of a vapor burner, which merely meant a difference in the change in the size of the holes in the side wall of the cap.

Q. Those instructions were given to the defendants in these cases? A. They were given to counsel.

Q. And the knowledge of the art which you expected them to exercise was the knowledge at the time they constructed this burner, was it not? A. All they had to do was look at the Almond Patent and make a Chinese copy of it, and then make some holes of the proper size in the side of the cap. All of the knowledge they had as between the date of the Almond Patent in 1877 and the present moment was the size of the holes shown in the Almond Patent.

Q. You left that to their judgment? A. Naturally.

Q. Did you try these Almond devices yourself? A. I did.

Q. You do not know how the Almond device would operate if made in accordance with the Almond Patent, do you? A. Do you want a conclusion or matter of knowledge?

Q. I want your knowledge? A. I have no knowledge of it as a vapor burner. I believe it will operate very nicely.

Q. You do not know how it would operate even with the shield G removed, if the remaining portion were made in exact accordance with the Almond Patent, do you? A. No sir.

Q. If it were made in exact accordance with the Almond Patent, with the shield G removed, the size of the openings otherwise being followed, you would expect it to operate as described in the Almond Patent? A. I would expect it to have much more visibility than you would want for a vapor burner.

Q. Would you expect there would be a small flame at the upper end of the wick and a larger flame outside the cap? A. With the shield G removed.

Q. Yes. A. Yes, the flame would come out of the upper row of holes.

Q. And the same would be true with the shield G there? A. No, I don't think that, with added metal about the torch, you would get very much flame issuing out of the holes because by reason of the presence of the shield G, the space between the cap and the shield G would be filled with gas, if anything, rather than air, to the point where there would be very little luminosity left. The flame, if it went anywhere, would probably go upwards in the general direction that the draftsman has attempted to indicate on Fig. 1 of the patent.

Q. You say if the shield G were removed, you would expect to have flames such as are shown in the drawings of the patent? A. They would go out more, farther to the side, and would be quite visible.

Q. They would be blue, would they not? A. No, the tips of them would be yellow; I mean by that visible, and whether or not they were blue or had a gaseous crater would depend upon the temperature of the cap, how high the wick was, how high the oil was, and the temperature of the air.

Q. The desire of any one constructing a burner for heating purposes is to get a blue flame? A. Yes sir.

Q. The nearer they can get to that, the better the burner? A. Yes sir.

Q. With the shield G removed, how would that flame be? A. If the barner were otherwise constructed just as it is in Almond, I have just described what I believe would take place with the shield G removed. You would not have any chimney effect there about the flame, and the part G would act as a baffle plate, and the burner is hotter with the shield than without. I might compare this to the ordinary kerosene lamp. If you take the chimney off of it you have a flare. If you put the chimney back on it, you feed air into it and break the current of air and you get better light because that chimney is transparent. That is an opaque chimney; when he puts it on he gets better combustion. When he takes it off he gets less combustion.

Q. Then as I understand you, you would expect, if the shield G were removed from the Almond device, you would not get as good a flame for heating purposes as with the shield present? A. You have a torch like the defendants' torch if you take the shield off. If you put the shield on you would have the same thing you would have here if you took a tomato can and put it over the

top of this; you would make an outside chimney which would concentrate the heat and give you a better burner.

Q. In both of those situations, that is, with the shield on as shown in the patent, and with the shield off as you have done in your models, but the device being otherwise the same as shown in the patent drawing, would you expect to have the two separate flames, the one on the inside and the other on the outside? A. You mean a flame within the cap and a flame without the cap?

Q. As shown in the drawing? A. That would depend entirely upon the conditions under which the burner was operated. At one time you might have flame in both places; another time you might only have it on the outside; another time you might only have it on the inside.

Q. With the shield removed, if you had any flame on the inside, it would be a very small one, would it not? A. Well, it might be very large; it might fill almost the interior of the cap; I couldn't tell you unless I knew the height of the wick, and whether it was in still air or in moving air; how hot the torch was.

Q. If it were operated as described in the patent, it would be a very small flame on the inside, would it not? A. If operated as a vapor burner?

Q. If operated as a vapor burner, as described in the patent? A. Yes. You want maximum heat and minimum light.

Q. The Almond Patent states, beginning with the last paragraph of the first page:

> "In use the flame is started by igniting the upper end of the wick and then closing the cap I upon the tube H. The wick-flame burns then in a chamber, H, to which a small proportion of air is admitted through the rim b or plate F, and from which gases can freely escape through the comparatively large holes in the tube H. In other words the flame is reduced to the bare possibility of existence, but not entirely stifled," . . .

Q. That refers to the flame at the end of the wick, does it not? A. Almond is there referring to the flame at the end of the wick within the cap, and is aiming to produce a maximum amount of heat with minimum amount of flame at that point because he does not want to soot up the inside of the burner. Now, having created

as much heat as he can in getting the cap as hot as possible, he says on the second page of the patent:

> "The vapors thus created, or other combustible gases, escape through the holes of the tube H into the annular space formed between said tube H and the tube G. In this space the vapors or gases meet a supply of fresh air which reaches them through the apertures of the tube G, and, when ignited, produce a perfect heating flame," • • •

The visible flame in this torch at all times, as I see it, would be that flame which extends out from the outside of the cap and the holes, and the height of the wick and the other various factors which go to make up that flame are so proportioned to each other; that the flame is luminous if you want a light, and it is as nearly blue as you can get it if you want heat.

Q. It does not say anything about a luminous flame, does it? A. It does not have to.

Q. It does not say anything about wanting light; that is something you introduced; this wick is round, hollow wick, is it not? A. Yes sir.

Q. Down inside that hollow wick extends the lower arm of this T-shaped member marked f, I believe; that is true, is it not? A. That member f as shown in section in Figure 1 is probably circular and shaped like a collar button. It is merely for the purpose of further conducting heat up into the imperforate cap.

Q. The lower part of that T-shaped member f is within the walls of the circular wick? A. That is right.

Q. In your models G and and J, the openings in the part marked H are relatively much larger in proportion to the size of the part H than shown in the drawing of the patent; is that not true? A. Yes sir.

Q. With the holes in the part H of the size which they appear in these two exhibits G and J, would you expect to have the device operate in the same manner as that described in the patent, that is, with a small flame at the upper end of the wick and a larger flame enveloping the part marked H? A. That is what happens.

Q. You find two separate flames, one on the inside of the wick and the other on the outside? A. We assume that the flames are separate. We have no way of telling that except that at times you can see extending from one of the flame holes a plume of flame. It is ap-

perently not connected up with the flame in the burner, but is lit by reason of the gas extending from the hole.

Q. Supposing those torches were placed out in the air, where there was considerable air stirring, would you expect to have two separate flames, one on the inside and another on the outside? A. It would depend upon whether I was on the leeward or windward side. If I was on the leeward side of the torch and the wind was blowing, if there was a hole at that point it is quite possible that the gas flame could ignite up almost to the cap; it might be spaced away from the cap one-sixteenth of an inch.

Q. By the gas flame, what do you mean, the flame from the wick or the other flame? A. From the outside.

Q. You mean from the outside the flame might come in and connect up with the flame from the wick? A. It might jump back and forth continuously.

Q. So that there might be a single flame if the holes in the part H were large enough? A. At times it would be single and at times double.

Q. There is nothing described in the drawing or specification of the Almond Patent that contemplates any such result, is there? A. No. It is common to all vapor burners.

Q. I will appreciate it, Mr. Van Deventer, if you will answer my questions and not add your arguments. In this device the Almond patent describes the part marked E as being a wooden or other bad heat conducting base block; that would indicate that he wishes to avoid any transfer of heat from the burner down to the fuel holder, would it not? A. He says a bad heat-conducting base; and I assume what you state is a fact, he does not want the bottom of the torch to get so hot you cannot pick it up.

Q. And he further states that this wood block E, together with the tube D, is by preference covered with asbestos paper or other non-combustible substance. That protection of asbestos paper further indicates that he wants to avoid any transfer of heat from the burner down to the base, does it not? A. Yes, sir.

Q. Will you point out to the court just what the part D is, referred to in that quotation; the tube D, it is very indistinct on the drawing? Is it the part that immediately surrounds the wick tube and extends upward

ly from the block E? A. The part D is a hollow, exteriorly-threaded flange which supports the burner proper and is screwed into the body A forming the fuel receptacle.

Q. It is that supporting member or supporting tube D that is covered with asbestos? A. I take it the bottom side of it is. I don't see how the parts that screw into the torch A can be so covered. This flange D has an inwardly-extending end which is in metallic contact with the wick tube or comes very near to it. I take it that the asbestos paper covers the bottom of the wooden block E and perhaps the lateral flange of D which is secured thereto.

Q. You mean that the flange is right on top of the wooden block? A. That is right.

Q. That flange is not referred to as the tube D, is it in the specification? A. I have been talking about the tubular guideway D. He said: "A wooden or other bad heat-conducting base-block, E, is rigidly affixed to the tubular guideway D,"—a flange.

Q. That is tubular? A. Yes, that is tubular, and the wick tube extends down through the middle of it.

Q. And it is that tube D that is covered with asbestos paper? A. The neck of it; the portion of it that is screwed into the lamp body could not be.

Q. But the exposed portion of it? A. The exposed portion of it is covered with asbestos paper.

Q. Is there any other patent among those to which you have referred, or among those in the volume that has been filed by the defendants, which in your opinion approaches the structure of the patent in suit as closely as does the Almond Patent which we have been considering? A. Not in the physical appearance of the structures.

Q. You have selected that as the best reference against the patent in suit? A. You mean from the standpoint of physical appearance or the standpoint of patentability.

Q. Standpoint of patentability, I would say? A. I think there are other patents equally as pertinent; the patent to Martine.

Q. You think Martine is as close to the patent in suit as is the Almond Patent? A. From the standpoint of patentability, yes.

Q. In this Martine Patent there is a wick tube which carries at its upper end a part which is described as a perforated tube of sheet metal, C. What do you understand the perforations in that tube C to be for? A. To permit the flame to go out if you put something on top of the burner. This was a laboratory burner. It was customary to set, for example a metal dish on top of it. When you did that the flame had to have somewhere to go; so they put these perforations in it; also put those perforations to admit it so that when you use it as a straight burner, shown in Fig. 1, you would get the maximum combustion.

Q. Is there anything in the patent to support your statement that the flame was ever intended to pass out through the openings in the tube C? A. No sir.

Q. That is your conjecture? A. That is the common knowledge in the art.

Q. What other patent or patents do you select as approximating the disclosure of the patent in suit as closely as does Almond? A. The patent to Wenzel, 577,090.

Q. That is one of the state of the art patents? A. Yes sir.

Q. Of what material do you understand the part 3 to be made? A. I take it to be metal; it is sectioned for metal.

The Court:

You have an exhibit here which corresponds to the Wenzel Patent?

A. Yes sir.

The Court:

Which one is it?

A. Defendants' Exhibit D.

The Court:

Very well.

Q. And in that exhibit you have made that globe or shade of metal, have you not? A. Yes sir.

Q. Are there any openings in that globe or shade except at the bottom and top? A. No sir.

Q. The flame, if it projects high enough, or if it projects high enough to be visible, would pass out of the central opening at the top? A. Yes sir.

Q. Do you think that this Wenzel construction would be of any use as a warning signal to be placed outdoors where it is exposed to wind and rain? A. In the test I witnessed it made a very good one.

Q. That is, you tested this Exhibit D? A. Yes sir.

Q. You found it made a very good warning signal in what kind of weather? A. Well, it was rather cloudy. We poured some water on all exhibits during that test. It was fairly windy.

Q. Was this in the daytime or night time? A. Daytime.

Q. You thought it made a good warning signal in the daytime? A. I found it looked like all of the rest of them.

Q. Could you see the flame at all? A. Surely.

Q. The flame did project higher than shown in the Wenzel Patent, did it? A. Yes sir.

Q. Do you have any idea how much wind velocity there was on that day? A. No, I would not want to venture a guess.

Q. It was not a perfectly still day? A. No, it was fairly windy.

Q. Can you select any other of these prior art patents which you consider approaches the disclosure of the patent in suit as closely as does the Almond patent? A. The Billingham Patent, 181,030, strongly suggests the elements of the patent in suit.

Q. You have already stated you never tried out a structure made in accordance with the Billingham Patent?

The Court:

He said he could not find any. He sent a man down to some gas company.

Q. Yes; did you make one in accordance with the Billingham Patent? A. I did not.

Q. Did you give instructions to have one made? A. I did not.

Q. Do you know whether one was made by either of the defendants in this case? A. I don't know.

Q. You never saw one? A. No sir.

Q. They never told you they had made one? A. No sir.

The Court:

Why did you not have one of those made the same as you did of Exhibit D?

A. I thought the others were the best references, Your Honor.

The Court:

I understood you to say this was just as close as the other references; that is the reason I am asking you the question. Apparently you do not think that.

A. We had to make a choice somewhere as to where we would stop in making models, and we picked out the others.

The Court:

You made one of Wenzel, and I wondered why you did not make one of Billingham, if Billingham were just as close.

Q. Have all of the models which were made been produced and offered in evidence, that is, made representative of the prior art as you interpreted it? A. All that I have seen are here submitted; all that I asked for.

Mr. Owen:

Before we leave this Almond Patent, I would like to have Your Honor notice the size of those flame openings and compare them with the size of the openings shown in the patent drawings.

The Court:

The patent in suit, you mean?

Mr. Owen:

No, the Almond patent.

The Court:

I have the Almond patent here. Where are the holes you are referring to here?

Mr. Owen:

In the Almond Patent?

The Court:

Yes.

Mr. Owen:

They apparently are not lettered. Right there is one of them.

The Court:

Under the H?

Mr. Owen:

Yes, under the H, under both sides. I would like to have you note the relative sizes of the holes in this Exhibit G, and Exhibit J, which the witness has produced as representing a part of the Almond structure after he has removed this shield G.

The Court:

I will put down here so that I will not forget it.

Compare holes of Exhibits G and J with the Almond patent."

Q. Have you Exhibits 2-C and 2-B before you? A. I have.

Q. In your testimony this morning you stated that your understanding of the word, "disposed", or the words, "disposed on the outer sides of said torch body", in Claim 1, called for a mounting of the cap directly on the body; that is correct, is it not? A. Yes sir.

Q. Then you give that term, "disposed", the same meaning as the term, "mounted on"? A. A. Used in that way, yes.

Q. And you take the position that both terms, "mounted on" and "disposed on" require the mounting to take place immediately upon the torch body? A. It is necessary to so read the claim in view of the prior art.

Q. Just disregarding the prior art for a minute, would you say that it would be a fair use of language to refer to the cap portion 7 of the Bolser Torch as being mounted on the torch body 1? A. I would not so regard it.

Q. It is carried by the torch body 1, is it not? A. Yes sir.

Q. And the only reason you say it is not mounted on the torch body is because the wick tube is interposed between the torch body and the cap 7; that is right, is it not? A. That is right; mounted on the wick tube, and not on the body.

Q. In other words, the wick tube is carried by the body and the cap is carried by the wick tube? A. That is correct.

Q. In the drawing of the patent in suit there is an intermediate part between the torch body and the cap 7, is there not? A. You mean a threaded flange?

Q. I mean the double threaded flange? A. I think that is part of the torch body.

Q. You call that part of the torch body? A. The torch body is not complete without it; that is the answer.

Q. Suppose that flange extended up; instead of being broader at the top than at the bottom, suppose it extended up in the form of a tube for one-half an inch; would you then say that the language of these claims would not apply to the structure? A. If you extended this unumbered flange up?

Q. Yes? A. It would still be part of the torch body.

Q. Then it would be mounted on the torch body? A. If you monuted the cap 7 on it?

Q. Yes? A. It would.

Q. So that it is not a question of separation or distance between the cap and torch body, but it is the fact that the wick tube carries the cap in the defendants' structures, and the flange unnumbered element in the patent in suit carries the cap 7; it is for that reason you say that the cap is mounted on the torch body in the patent in suit, and not in the defendant's structure? A. That is right.

Q. Would you say that the wick tube of the Bolser Torch, Exhibit 2-B, is mounted on the torch body? A. The wick tube 6?

Q. Yes? A. Yes sir;

Q. Would you say that the wick tube 6 is the Kan-Keen Torch, Exhibit 2-C, is mounted on the torch body? A. Yes sir.

Q. In both of these exhibits the cap is, in turn, mounted on the wick tube? A. Correct.

Q. And because the wick tube intervenes or is interposed between the cap and the torch body you say the cap is not mounted on the torch body? A. That is correct.

Q. There is nothing in the claim that requires the mounting of the cap to be directly on the torch body, is there? A. Claim 1 we are now speaking of?

Q. Yes; and in Claim 1 the term is "disposed on", but I understand you make no distinction between "mounted on" and "disposed on", so you may answer the question with regard to Claim 1?

Question read.

A. According to my interpretation of the word "disposed", it is necessary to place the cap on the torch body.

Q. Without anything intervening? A. That is correct.

Q. According to your interpretation of the words "Mounted on", in Claim 2, the same would be necessary? A. Yes sir.

Q. So that it is simply a question whether the language of those claims requires the mounting of the cap to be directly on the torch body? A. You are considering the claims merely from the standpoint of language, and not in view of the prior art?

Q. Considering now as language in the claims, yes? A. I would say that it was necessary, in respect to claim 2, to have the flame guard for the wick mounted on the outside of the torch body, that is to say, directly mounted on the torch body.

The Court:

As in Plaintiff's Exhibit 3-A?

A. Yes, Your Honor.

The Court:

If there is any departure from that, your notion is that there would be no infringement?

A. Yes, Your Honor.

The Court:

You believe that that is an essential element of the claims of the patent in suit?

A. Yes; that is Withrow's contribution to the art.

Q. Referring to Exhibit 2-B, you testified that there is no heat transference through the flange marked 5. I will ask you to consider the curved flange at the lower end of the cap, and state whether or not that would constitute a heat-transferring flange? A. Referring to the downward-extending neck on the cap 7?

Q. Yes? A. That transfers heat.

Q. And it transfers it to the wick tube and the wick? A. Yes sir.

Q. Referring to Exhibit 2-C, the same would be true of the flange at the lower portion of the cap 8? A. The two drawings and the two devices are identical in that respect.

Q. Then both of these structures have a wick holder 6 having a portion in contact with the wick and a supporting and heat-receiving flange, do they not? A. Please read the question.

Question read.

A. There is no heat-receiving flange in the Bolser and Kari-Keen devices; if you are referring to the flange 5.

Q. You are referring to the flange marked 5 in Exhibits 2-B and 2-C? A. Yes sir.

Q. Well, my question—I have called your attention to the flanges at the lower portion of the cap 7, and you have stated that they are heat-transferring flanges; and they transfer heat from the cap to the wick tube or wick holder, do they not? A. They do.

Q. With that in mind, is it not true that both of the defendants' structures have a wick holder which has a portion in contact with the wick, and that they also have a supporting and heat-receiving flange? A. The drawings that you show me, Exhibits 2-B and 2-C identify the heat-receiving flange as the flange 5 on the wick tube or wick holder. There is no part of the part 7, which is the cap, identified as a heat-receiving flange.

Q. I am asking you to disregard the lead line which leads to the numeral 15 and consider that lead line as extending from the flange at the lower part of the cap K; and with that understanding, will you answer the question? A. But that is not my understanding.

Q. That is what I am asking you to assume? A. These charts purport to apply claims of the patent to defendants' structures, and the heat-receiving flange in the patent you have identified with the numeral 5 on these drawings is the heat-receiving flange I have been talking about throughout my testimony. If we are going to switch and call something else a heat-receiving flange, my understanding of the whole situation may be somewhat different from what it has been.

Q. I am asking you to assume as you have stated that these flanges at the lower portion of the cap 7 are heat-transfering flanges. Is it possible for you to consider that as the element 5 and then answer this question? Do these tructures as shown in Exhibits 2-b and 2-c have a wick holder which has a portion in contact with the wick? They have that, have they not? A. Yes, sir.

Q. And do they have a supporting and heat-receiving flange? A. As part of the wick holder, they have not.

Q. I am not asking you whether part of the wick holder or not. There is nothing in the language of the claim or in the language of my question that asks you to assume that. The claim simply says a supporting and heat-receiving flange. You state that the flange or flanges at the bottom portion of the cap 7 are heat-receiving flanges—

Mr. Bair:

May I ask which claim you are referring to, Mr Owen?

Mr. Owen:

Claim 11.

A. On these charts that you handed me, Exhibits 2-B and 2-C, you have designated the supporting and heat-receiving flange with the numeral 5, and it forms, together with the wick holder 6, an element of the claim. I see no way you can now separate the heat-receiving flange from the wick tube and say that it is somewhere else.

Q. In other words you do not admit the possibility of having designated the wrong element as the heat-receiving flange in these drawings? A. The element 7, the cap, has a heat-receiving portion integral with, and which extends around and embraces the wick tube, and is in exchange relation with it; there is no question of that in my mind; but I cannot read claim 11 as including as an element of the claim a heat-receiving and supporting flange in any other place except that you have designated with the numerals 5 and 6.

Q. But nevertheless heat is transferred or conveyed from the cap 7 through the horizontal flange at the bottom to the wick-receiving tube or wick-holding tube, is it not? A. Certainly.

Q. Now, referring to Claim 12, the language there is, "Comprising a wick holder having a portion in contact with the wick and a lateral flange,"—now in the patent there is a lateral flange which is marked 5 in Exhibit 2-A, which does extend from and is an integral part of the wick holder; that is right, is it not? A. Yes sir.

Q. And in that drawing Exhibit 2-A, the cap extends upwardly from the outer edge of that flange; is that correct? A. Yes sir.

Q. In the drawing, Exhibit 2-B, the wick holder has an integral flange at the bottom, but there is connected with it at the top a flange which forms a part of the cap 7. Now if you consider that flanges as an integral with the wick holder, you would have no hesitation in admitting that the structure complies with this language of Claim 12, would you: "A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a lateral flange",— A. So far, I go with you.

Q. And the lateral flange in that claim is for the purpose of transferring heat from the cap 7 to the wick holder, is it not? A. I am talking about the laterally-extending flange 5 on the wick holder.

Q. Yes; and I am asking you to assume that the lateral flange on the bottom of the cap 7 is formed integrally with the wick holder 6? A. That is another element entirely of the claim; the claim goes on to recite, "a wick holder having a portion in contact with the wick and a lateral flange,"—then as a separate element of the claim there is included, "a cap enclosing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange."

Q. Yes? A. The bottom of the cap in the drawings, Exhibits 2-B and 2-C, is not in heat conducting relation with the flange 5, in the sense that term is employed in the claims.

Q. Let me ask you to assume this: That instead of continuing the metal of the cap down to and including the in-turned flange, you consider that cap as stopping at the lower end of the vertical portion. Can you follow me there? A. Yes sir.

Q. Now if the separation were there instead of between the inner end of the flange and the wick holder, you would have identically the construction shown in the patent drawing, would you not? A. You would have a cap supported in midair, with nothing to support it, like Mohammed's coffin.

Q. No, you would have your cap supported on the outer end of the flange? A. When you say that you have the patent in suit.

Q. Then the only difference between the patent in suit and the defendants' structures, in the respect to which we are now referring, is that in the patent in suit the lower edge of the cap makes contact with a flange which extends outwardly from the wick tube, and in the defendants' structures that flange forms a part of the cap and extends from the cap inwardly where it contacts with the wick tube; is that not true? A. I do not consider the contracted bottom of the cap to be the equivalent of flange 5 extending from the wick tube.

Q. Would it make any difference in its function of transferring heat whether the break between the parts is at the point where the flange contacts with the wick tube or at the point where the flange contacts with the cap? A. Yes. The two structures, so far as the heat-

transfer is concerned, are exactly opposite each other. In the patent in suit the heat flows from the cap 7 into the unnumbered spud which is welded into the top of the receptacle 1, and across the flange 5 which is the supporting and heat-receiving flange of Claim 11, and thereby gets into the wick and vaporizes the oil. In both of the defendants' structures, taking Exhibit 2-B, the Bolser structure, the heat from the cap 7 is transferred directly to the top of the wick tube; and if any heat transfer does take place through the laterally-extending flange 5 of the wick tube, it is in the opposite direction from the heat transfer in the patent, and is merely an accidental thing and performs no particular function. It might in very cold weather tend to keep the oil down in the container 1 a little warmer; but the whole purpose of heat transfer in these devices is to keep the wick tube and wick and the oil in the tube hot.

Q. And defendants' structures both do that, do they not? A. They do.

Q. You persist in disregarding my request that you consider the flange at the lower end of the cap as the heat-transferring flange. You admit that that is the heat-transferring flange in both defendants' structures, do you not? A. It is in heat transfer relation to the top of the wick tube, but it is not the heat-transferring flange of the claims.

Q. We will leave that to the court. This flange at the lower end of the cap 7 is in heat transfer relation to the wick tube? A. Yes sir.

Q. In the defendants' structures? A. Yes sir.

Q. And in plaintiff's structure, that is, the structure of the patent in suit, it is not? A. No. In the patent in suit the cap 7 is in heat transfer relation to a flange, and heat passes across the flange 5 and into the wick tube.

Q. That flange is formed integrally with the wick tube? A. Correct.

Would it make any difference in the operation of this device if that flange were formed integrally with the cap 7 instead of being formed integrally with the wick tube 6? A. Yes sir.

Q. It would operate differently? A. Yes sir.

Q. Are you still going back to the flanges which extend upwardly from the wick tube in Exhibits 2 and 3?

A. The operation of the defendants' device in some respects is superior to that of the plaintiff, in that the heat transfer from the cap 7 to the top of the tube, top of the wick tube 6, is direct; that is, under certain conditions of operation the defendants' structure may be superior. Under other certain conditions of operation the plaintiff's structure may be superior. In the plaintiff's structure the heat from the cap 7 is transferred directly to the body of the torch, and the heating effect on the body of the torch and the oil contained therein is somewhat greater with the plaintiff's device than with the defendants'. Now under operating conditions where that condition is beneficial the operation is different than it would be with the defendants' device; the operation is not the same.

Q. I doubt if I can get you to admit it but I am going to try once more. Will you look at Exhibit 2-A? Now can you conceive of the lower part of the flange marked 5, which extends from the lower end of the cap over to the wick tube; can you conceive of that being formed integrally with the cap? A. Yes sir.

Q. And can you also conceive of the possibility of forming the upper one of those two flanges, the one that is connected with the upper half of the wick tube 6, as remaining as a part of the wick tube? A. Yes sir.

Q. If that construction were made, is it not true that you would have the same transfer of heat from the cap through the flange to the wick tube? A. You would have the device of the Almond Patent.

Q. I am not asking you that. I wish you would answer my questions. We can get along and save a lot of time. A. You would have a cap mounted on the wick tube, and what would hold the wick tube in place if you moved the two flanges up and formed the bottom of the cap?

Q. If you followed my question you would have seen what would hold the wick tube in place. I will state it again. I ask you to assume that the flange which is marked 5 in Exhibit 2-A, and which projects outwardly from the lower half of the wick tube, is made integrally with the cap instead of with the wick tube; then I am asking you to assume that the wick tube is continuous, and has this outwardly-extending flange which is the upper half of the part marked 5 in Exhibit 2-A. Now is

here any reason why that would not form a perfectly operable structure? A. What supports the wick tube in the torch?

Q. The upper flange rests on the lower flange; that is what I have been trying to say? A. But you said you were going to move 5 up to the bottom of the cap. I am trying to answer the question. I don't think I understand it.

Q. I must be dumb in asking you the question then. This wick tube in Exhibit 2-A is formed of two sections, each of which has an outwardly-extending flange, has it not? A. Yes sir.

Q. Now I am asking you to assume that that lower flange, instead of projecting outwardly from the wick tube, projects inwardly from the bottom of the cap 7, and supports the wick tube through the upper flange, which will still be a part of the wick tube. Would that be a practical construction? A. Does the cap 7 still continue down and go into the threaded spud or cut the spud off?

Q. Yes, it can go down into the threaded spud, just as it is here? A. That would change the interior air space in the cap.

Q. I am asking that the dimensions be retained; I am not asking you to change the dimensions at all? A. I don't know whether it would be practical or not.

Q. But if it were built in that way, there would be a heat transfer from the cap through the flange to the wick tube? A. Yes sir.

Q. I want to return for a moment to the Almond device. The devices you identified as the Almond Patent, being Exhibits G and J; on how many different days did you test those devices? A. One.

Q. And for how long a time did you test them? A. I should say an hour.

Q. Where did that test take place? A. In the City of Toledo.

Q. What location? A. I couldn't tell you that; somewhere near the hotel down here, in a garage lot.

Q. It was on the ground in a lot? A. Yes sir.

Q. Surrounded by buildings? A. Yes; we were in a pretty drafty place.

Q. What day was that? A. Last Tuesday.

Q. This week, Tuesday? A. Yes sir.

Q. This Exhibit M was offered in connection with your direct testimony, although you were not examined regarding it. Do you know anything about it? A. No, never seen it before.

Q. Have you ever seen a cnstruction which was made in exact accordance with the sectional drawings or figures at the left of the inside page? A. No sir.

Q. Did you have anything to do with the making of drawings, Exhibits K and L? A. No sir.

Q. You never saw them before to-day? A. I think I saw them Monday night when I arrived here.

Mr. Freeman:

We have no redirect; except if it is agreeable to the court and convenient, we are perfectly willing to morrow morning to fill these various torches, that is, the model of Almond, the model of Wenzel, the model of Bolser with the down-turned skirt, the down-turned skirt of Kari-Keen, together with the Kari-Keen commercial flare and the Bolser flare, and make any demonstration on any lot or any place else, if convenient, where the court wishes.

The Court:

It is all right with me. Do it out in front there and I will look out the window.

Mr. Owen:

I have no objection to such a test, except that it will not mean anything unless the weather is right.

The Court:

Suppose you take it up with the weather man.

Mr. Freeman:

They will all be tested at least under the same conditions. In other words, we will put all the flares in the same environment.

Mr. Owen:

Yes; but you can put these open flame torches out on a day like this, or any average day with average weather, and they will burn until the oil is gone. But that is not the situation that this invention was designed to meet.

Mr. Freeman:

I was talking about the Almond, Wenzel, and Bolser models, with and without skirt, and the Toledo Torch, and I had no reference to those. If the Court wishes, and we have the time, we will have them all available.

CECIL H. MYERS

My name is Cecil H. Myers. I live in Sioux City, Iowa. I am Vice President of the Kari-Keen Manufacturing Company.

I witnessed a test made of defendants' burners like Exhibits 3-b and 3-c and of plaintiff's burner like Exhibit 3-a, and of the device like Exhibit G, a model of the Almond patent. I witnessed one test that included this model, Exhibit D, of the Wenzel patent.

Mr. Owen:

I should like to enter an objection merely for the record on account of the fact that Exhibits J and G which purport to be the Almond device, are not the Almond device at all; they are only a part of it, in the first place, and, in the second place, what there is of it, is changed in a very material respect from the Almond patent.

The devices were tested under the same conditions. They were tested under varying air drafts and under varying waterfall.

We lighted the flares, put them all in a row, and had them all burned. We could not tell very much difference in the size of the flame emitted from any of them. There was a slight variation with some. We turned on a strong air blast applying it the same on each one. We kept putting this air blast closer to make it stronger until the flares began to go out from the wind. The flare made after the pattern of the Almond patent was the last one to go out. It stood the wind test stronger than any of them. It was Exhibit G. Exhibit J was in the test also. We tried them with waterfall. There seemed to be no apparent difference in the way they were extinguished in waterfall. They could all be put out by the blast, but it took a stronger blast to put out the one shown in Exhibit G. You could put out all of them by dropping water on them. Relatively they stood that test about the same.

REBUTTAL

JOSEPH E. WITHROW

I never saw a structure made like the Almond patent, No. 193,796. I heard the testimony of defendants' witness regarding this patent.

Comparing the flame openings in the patent with those in Exhibit G, I would say that proportionally they are at least nine or ten times greater in Exhibit G than in the design shown in the patent. The openings of Exhibit J are proportionally very much larger yet, than Exhibit G.

From my knowledge of the operation of torches and flares, if a structure made in exact accordance with the drawings and description of the Almond patent, were operated in the open air with any draft at all, the lighted vapor would blow out immediately, and the flame inside, which they designate as being very small, I am sure would also blow out in any breeze of any strength.

Q. How would that condition be affected if the shield G were removed? A. I was suppoisng that was removed. With the shield G on—

The Court:

It would help some, would it not?

A. Yes, sir.

The Court:

How much?

A. I still don't believe it would stand a very strong wind even with the shield on, but stronger than one without the shield on.

If made in exact accordance with the drawing of the patent with the shield on, I don't believe there would be two distinct flames, one at the upper end of the wick and the other at the outside of the cap H, if there was much stirring of the air. That is, if it was out-doors where there was a breeze. If there was no breeze, there would be a separation of the flame. If placed in a strong breeze, the vapor flame on the outside, emitted from the hole, would be the weaker, and attacked first, that would go out first.

Q. And that vapor, if there were any breeze, would be blown to the far side of the cap H, and that would be forced out at that side with the other side open to the wind, would it not? A. Yes, sir.

It would take a very slight breeze with the size of the flame shown on the inside and described in the patent and shown in the specification to blow out the inner flame. That would be less true with the shield G present, but it would still be true.

I would not say that there would be any heat transference from the burner cap down to the tank A in the structure shown in the Almond drawing. It is insulated against it.

The Court:

Where do you think this asbestos is on there?

A. On the wood and around the sliding tube D in which the inner tube slides.

D is a stationary tube, and the inner tube slides up and down in that.

Q. What colored flame would you expect to secure from a device made in strict accordance with the drawing of the Almond patent? A. Blue.

The Court:

What kind is preferred in practice, red?

A. If we can get it.

The Court:

What is the practice?

A. Yellow.

Q. What do you understand by a luminescent flame? A. A flame you can see, that has a color to it.

Q. In practice it is orange or yellow? A. It is more orange than yellow, yes.

Q. That is essential to the proper functioning of a flare or torch as a warning signal? A. Yes, sir.

A device made in exact accordance with Figure 2 of the Wenzel patent would stand some air. I would think with the flame as it is, it would stand about sixteen or seventeen miles an hour. With rain and wind, I think it would go out very quickly and at much lower rate of wind velocity. From the statement in the Wenzel patent

> "5 indicates a globe or shade, which may or may not be used when the lamp is used as a night-light"

I would understand the shade to be made of glass.

The Court:

Dark-colored glass, is that what you you have in mind?

A. Some substance through which light would come.

The Court:

This is a light you want on during the night?

Mr. Owen:

A dim light.

The Court:

You would not want anything but colored glass?

Mr. Owen:

Colored glass, yes.

The Court:

Blue glass.

Mr. Owen:

Yes, but you get no light whatever through that metal shade.

The Court:

I do not suppose you would.

Referring to defendants' Exhibit M and particularly to the sectional figures at the left of the inside page, I understand the upper end of the wick to be located above the air inlet holes and just below the flame outlet holes.

In Exhibits K and L, the location of the wick is below the inlet holes. It is shown best in the cut marked B, where the wick holder has an expanded flange at the top, which does not really come in contact with the wick, it only surrounds the wick; and in that same cut the inlet holes can be seen very much lower than this expanded portion of the wick holder. In the cut C, it shows the wick at the top of that expanded flange, which would necessarily result in the top of the wick being considerably above the inlet hole.

I am familiar with the structure of the Billingham patent, No. 181,030. I have tested one out throughly. I got a cut from a 1910 catalog of the E. P. Gleason Manufacturing Company, plaintiff's Exhibit 31. I asked Mr. Close to make drawings in the proportions exactly as shown in the patent, increased to the size of eleven inches, noted on the catalog page. I gave these drawings to a die maker, from which he made a torch. I tried this torch out with sperm oil, as recommended in their catalog, and put the wick at a reasonable height, and it worked very well. I took it to a gas jet. There was no flame showing through the holes at the top. The flame was approximately the same as that shown in this page of the catalog. I took it to a gas jet. At first I attempted to light it as described in the patent, but it was quite dif-

sult, and I would have to hold the upper holes over the gas jet a long time before the gas jet would light, and every time it did light the flame inside would be extinguished. Billingham's patent reads:

> "To light a street lamp: The cock of the same having been opened to allow of the supply of gas to the burner, the openings or perforations h are brought into proximity with the burner."

Those openings h are at the top

> "and the flame, issuing through these perforations h, and deflected by the disk of the metal i, lights or ignites the gas."

In the first place, there was no flame being diverted through those holes at the top, and when I held the top holes over the gas jet, I had to hold a long time before the gas would ignite at all, and when it did, it would always put the flame inside the torch out. But in pulling it down over the gas jet and putting the holes d in contact first—those are the lower holes—it would light very quickly and very easily and the flame inside would remain burning, and it worked perfectly that way. I tried that many times at that time. Later I filled it again and had Mr. Close come down and we tried it again, and the results were identical. I also tried it with kerosene; first in an endeavor to try to get the flame high enough so it would strike the top closure and divert itself out through the holes, and in order to do that I had to raise the wick to about three inches. There was a great amount of vapor that came out of the top holes. The flame itself from the wick did not extend through the top holes, except that occasionally it would ignite and burn as a vapor outside, but that was only true the first few minutes. After ten minutes that ceased entirely. You could not get a flame at the top hole. I took it out-doors and at the least breeze, the flame kept going out of its own accord; so much carbon had formed it finally would be extinguished. I lit and re-lit it many times. Then I took off the wick and measured it and the wick had burned down to about an inch; and then I tried it at the ordinary height, about the height of a lamp wick, say, about one-eighth of an inch or quarter of an inch. That seemed to produce more carbon than the longer wick. The flame did not extend out of the top then. A great deal of smoke and vapor came out of the top, and finally the hole at the

top seemed to carbon up more quickly than it did with the longer flame. After the holes began to get choked that light would continue to go out.

You could light the gas jet with it burning kerosene but only through the lower holes. When you had the long extended wick and the torch was still cold, before it got hot, it was possible to light the gas jet out of the top; after a few minutes when the torch had gotten hot, then it was impossible to light it out of the top holes.

The ignited gas would enter in the lower holes evidently and the minute it touched the flame inside, the flame would follow down through the lower holes to the gas jet. I watched very carefully but never was able to see any flame come out of the upper holes.

Exhibit 32 is the torch I made in accordance with the Billingham patent. It has sperm oil in it at present.

When you place this torch alongside an open gas jet, the gas escaping from the jet enters these holes at the lower portion of the torch and passes it until it comes in contact with the flame and the flame follows that and goes down to the jet. It is almost instantaneous.

When I had this torch with the upper holes in contact with the open gas jet, it seemed to take some time for the gas to get in there and work down to the flame, sometimes it would take thirty seconds, forty-five seconds, and when the gas finally ignited, it would extinguish the flame. The teaching of the patent is that you use the upper holes to do the lighting.

The Heath patent, No. 66,021, says:

> "When the burner is to be lighted the apparatus is inserted through the bottom of the lamp, till its end coming in contact with the handle."

that is the handle on the gas jet

> "turns it over into the position represented in dotted lines. The cock of the burner is thus opened, and the gas escaping therefrom, entering through the apertures b and b' comes in contact with the flame of the lamp C and is thereby lighted."

The apertures b and b' are located both above and below, all along the sides, and that is the way I operated this torch. The only way you could operate it successfully would be by placing the torch so that the gas would enter the lower holes and not the upper holes.

CROSS-EXAMINATION

I did not operate a torch like the Heath patent.

I did not build any model like Wenzel or like Almond.

I will mark on Exhibit 11-b with a pencil how far the wick should project.

Looking at our own patent at the showing of the wick in dotted lines, I did not learn the proper height of the wick from the patent. As a matter of fact, the showing in the patent is different from what we now recommend to be the proper wick height.

I suppose if you put a wick in any of these flares and it did not burn to suit you, you would just change the height of the wick.

Q. I think you said the upper holes in the Almond Model, Defendants' Exhibit G, were nine or ten times greater than the size of the holes shown in the Almond patent? A. No, I did not; I said proportionately. I would judge them to be nine or ten times greater.

I would think, however, the patent shows proportionally more holes. I have no way of knowing exactly the relative total area of the holes shown in the patent compared with the relative total area with the holes shown in the model, Exhibit G.

I brought over the correspondence you requested.

I forgot about the records as to the first actual distribution of literature and first actual sales.

LYMAN W. CLOSE

I heard the testimony of defendants' expert with reference to the Almond patent.

With my experience in the practical operation of warning signals, I would say that a construction made in exact accordance with the drawing of the Almond patent would not operate as a warning signal. The flame would be very unstable and in any breeze it would be extinguished.

The removal of the outside shield G would increase the liability of being extinguished.

I would not consider this construction would make a suitable warning signal for use at night.

FURTHER CROSS EXAMINATION

I did not look up the early records of sales and distribution. I am quite sure they were in the latter part of January, 1929.

I think the circular you hand me, marked defendants' Exhibit O, is the complete circular from which Exhibit 8 was taken. These letters on the back of Exhibit O are letters of commendation we had from satisfied customers along through the same period of the letters of Exhibit 8 of complaint about the early Toledo torch.

Mr. Owen:

I should like to make a statement in that connection, Your Honor. I was responsible for cutting that section out of that circular and offering it alone. I did it not to avoid putting in those letters; the fact is I never read the letters; but on the outside of the circular is an illustration of our first torch; on the inside is the second torch, and that was put in for the purpose of showing the second torch.

I remember Exhibit 5, the package of complaint letters about our old type wick torches. I read yesterday from a letter from Hedge & Matheis Company of Portland, Maine to us. The letter now produced, dated July 29, 1927, and addressed to Hedge & Matheis Company is an answer. The answer contains the P. S.

> "For the past six months Toledo Torches have been thoroughly tried and carefully watched by the Iowa State Highway Commission in twelve scattered counties throughout the State of Iowa. This has taken place during the windy and very rainy spring and early summer which they have had, and as a result of this, on Wednesday last we received an order from the Iowa State Highway Commission for 1000 Toledo Torches. This has been the stormiest and wettest spring the state of Iowa has had for a good many years."

I testified yesterday that I knew of no instances of complaints under our new torch, where the real difficulty was not in fact due to some maladjustment, failure to comply with our instructions or something of that sort. In the answer to one of the letters of complaint, which were a part of Exhibit 5, the answer being dated February 13, 1928, addressed to Clarence H. Buehl, I said:

"We have your letter of February 10, and are at a loss to know just what to attribute the failure of Toledo torches to, if the fuel which your customer is using is of a good grade and the wicks are extended far enough. We have never known of a case where they were having trouble with the torches going out that we were not able to solve the difficulty by correcting either the grade of fuel being used or the manner in which the wick is being manipulated."

That was a company letter. I did not write those letters. It was sent to the customer by the company.

These letters I have read, I have produced in response to your request yesterday.

RE-DIRECT EXAMINATION

When we got complaints, while we were selling open flame torches, we tried to correct them. When we started the business, we were sold on the torch or we never would have gone into the business of producing it. We gradually arrived at the conviction that they were not all they should be. While we did receive a number of complaints at the same time we received some letters from customers that commended the torch and stated that they worked all right.

We found from the number of complaints that they did not work right. We found that out from our own tests on severe conditions; but those severe conditions were not very often present in actual practice or actual operation of the torch on the ground. It was only after all of these complaints did come in that we finally were forced to the conviction that they were not as practical as we would like to have them, and then we began to make those experiments I testified about yesterday.

Mr. Owen:

We have the information requested by Counsel. The first shipment of the torch involving the features of the patent was January 7, 1929. The first circulars of that torch were distributed at the Cleveland Road Show, January 14th to 18th, 1929.

STIPULATION

(Filed September 26, 1935)

It is hereby stipulated and agreed by and between the parties hereto, through their respective counsel, that the foregoing Narrative Statement of Evidence is true and correct, that it is complete and that it has been properly prepared and lodged as provided in the Rules, and that the only portions retained in question and answer form are those portions desired by the parties to be so stated.

It is further stipulated and agreed that the court may be asked to approve said statement of the evidence forthwith.

Bair, Freeman & Sinclair,
Holloway, Peppers & Romanoff,
Attorneys for Defendants.
Owen & Owen,
Attorneys for Plaintiff.

Dated: September 26, 1935.

CERTIFICATE OF COURT

(Filed September 26, 1935)

The foregoing narrative statement of evidence is hereby approved as a true, complete and correct narrative of the testimony introduced in these causes, and it is directed that the same be filed in the Clerk's office and so certified forthwith by the Clerk of this Court.

Geo. P. Hahn,
Judge of the U. S. District Court.

Dated: September 26, 1935.

ORDER APPROVING NARRATIVE STATEMENT OF EVIDENCE AND ORDERING SAME FILED

(Filed and Entered by the Honorable Geo. P. Hahn, on September 26, 1935)

No. 1408 In Equity.

Upon Stipulation by and between the parties hereto, through their respective counsel, it is Ordered, Adjudged and Decreed that the Narrative Statement of Evidence is hereby approved as a true, complete and correct narrative of the testimony introduced in these cases, and it is directed that the same be filed in the Clerk's office and so certified forthwith by the Clerk of this Court.

ORDER APPROVING NARRATIVE STATEMENT OF EVIDENCE AND ORDERING SAME FILED

(Filed and Entered by the Honorable Geo. P. Hahn, on September 26, 1935)

No. 1412 In Equity.

Upon Stipulation by and between the parties hereto, through their respective counsel, it is Ordered, Adjudged and Decreed that the narrative statement of evidence is hereby approved as a true, complete and correct narrative of the testimony introduced in these cases, and it is directed that the same be filed in the Clerk's Office and so certified forthwith by the Clerk of this Court.

STIPULATION RE CERTIFICATION OF RECORD

(Filed September 27, 1935)

Equity No. 1408.

In accordance with Section 6 of Rule 44 of the general rules of this Court, it is hereby agreed that the record as presented to the Clerk by the printer may be certified by the Clerk as required by law and the rules of the Appellate Court as a true, full and complete copy of the original pleadings, papers and orders used on the trial of these causes, as set forth in the Praecipe for transcript without further comparison by the Clerk.

Bair, Freeman & Sinclair,
Holloway, Peppers & Romanoff,
Attorneys for Defendants

.....

Attorneys for Plaintiff.

Dated: September 26, 1935.

STIPULATION RE CERTIFICATION OF RECORD

(Filed September 27, 1935)

Equity No. 1412.

In accordance with Section 6 of Rule 44 of the general rules of this Court, it is hereby agreed that the record as presented to the Clerk by the printer may be certified by the Clerk as required by law and the rules of the Appellate Court as a true, full and complete copy of the original pleadings, papers and orders used on the trial of these causes, as set forth in the Praecipe for transcript without further comparison by the Clerk.

Bair, Freeman & Sinclair,
Holloway, Peppers & Romanoff,
Attorneys for Defendants

.....

Attorneys for Plaintiff.

Dated: September 26, 1935.

PRAECIPE

(Filed September 26, 1935)

To the Clerk of the United States District Court,
Northern District of Ohio, Western Division:

You are requested to prepare a Transcript of Record to be filed in the United States Circuit Court of Appeals for the Sixth Circuit, pursuant to Appeals allowed in the above-entitled causes in Equity, which causes have been consolidated, and include in such Transcript of Record, the following papers and Exhibits, which are to be printed:

0. Title Page.

00. Caption.

1. The Bill of Complaint in Equity No. 1408.

2. Answer in Equity No. 1408.

3. Plaintiff's Interrogatories in Equity No. 1408, including attached circular.

4. Defendant's Answer to Plaintiff's Interrogatories in Equity No. 1408.

5. Defendant's Further Answers to Plaintiff's Interrogatories in Equity No. 1408.

6. Bill of Complaint in Equity No. 1412, omitting Paragraphs I, III, IV, V, VI, VII, VIII, IX, and X, and the prayer consisting of five paragraphs, and substituting for the respective parts omitted, the following:

---"Paragraphs I, III, IV, V, VI, VII, VIII, IX and X, and the prayer in this case are exactly the same as the corresponding paragraphs and prayer in the Bill of Complaint in Equity No. 1408."---

7. The Answer in Equity No. 1412, omitting Paragraphs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and substituting for the Paragraphs so omitted, the following:

---"Paragraphs 1 to 13 of the Answer in Equity No. 1412, are exactly the same as the corresponding Paragraphs of the Answer in Equity No. 1408."---

8. Plaintiff's Interrogatories in Equity No. 1412, including attached circular.

9. Defendant's Answers to Plaintiff's Interrogatories in Equity No. 1412.

10. Defendant's Further Answers to Plaintiff's Interrogatories in Equity No. 1412.

11. The Memorandum Opinion in Equity 1408 and 1412.

12. Final Decree in Equity No. 1408.

13. Final Decree in Equity No. 1412.

14. Stipulation for the consolidation of Equity 1408 and Equity 1412 for the purposes of Appeal.

15. Petition for Appeal.

16. Assignment of Errors.

17. Order Allowing Appeal.

18. Bond in Equity No. 1408.

19. Bond in Equity No. 1412.

20. Citation in Equity No. 1408 and Equity No. 1412.

21. Narrative Statement of Testimony.

22. Stipulation of Approval and Certificate of Narrative Statement of Testimony.

22½. Stipulation re Certification of Record.

23. This Praecipe.

24. Any orders extending time.

25. Clerk's Certificate.

PLAINTIFF'S PAPER EXHIBITS

Ex. 1. Withrow and Close patent in suit, No. 1,732,708.

Ex. 2-a. Drawing—Figure 3 of patent in suit—with terms of Claims 2 and 11 applied.

Ex. 2-b. Drawing of defendant's torch in Equity 1408 (Bolser) with Claims 2 and 11 applied.

Ex. 2-c. Drawing of defendant's torch in Equity 1412 (Kari-Keen) with Claims 2 and 11 applied.

Ex. 4. Circular of plaintiff's first open flame torch.

Ex. 6. Yellow tag sent out by plaintiff with old torches recommending 1½ inch wick exposure.

Ex. 7. Sketch showing experimental burner with long tube extending into fuel tank.

Ex. 8. Part of circular showing open flame torch on which plaintiff went into production in 1928. Actual device is shown in physical Exhibit 29.

Ex. 10-a.

Ex. 10-b.

Ex. 10-c.

Ex. 10-d.

Ex. 10-e.

Ex. 10-f. Drawings of experimental torches

Ex. 10-g. tried by plaintiff.

Ex. 10-h.

Ex. 10-i.

Ex. 10-j.

Ex. 11-a. Circular of plaintiff's construction torch embodying patented burner in suit.

Ex. 11-b. Plaintiff's direction sheet for burner in suit.

Ex. 11-c. Plaintiff's truck flare circular.

Ex. 15. Circular showing letter from Michigan State Highway Commissioner.

Ex. 17. Test records of oil consumption by open flame burner and plaintiff's and defendant's enclosed flame burners.

Ex. 18. Test records of plaintiff's enclosed flame burner and open flame burner as to wick consumption.

Ex. 19-a. Bolser circular.

Ex. 19-b. Bolser circular letter.

Ex. 19-c. Letter from Bolser customer enclosed with circular.

Ex. 20. Kari-Keen circular.

Ex. 22. Dietz first open flame burner circular.

Ex. 23. Dietz circular showing hooded burner.

Ex. 24. Dietz latest circular.

Ex. 25. Circular of McCloskey open flame torch made for him in 1925.

Ex. 26. Circular of McCloskey torch brought out in 1929.

Ex. 27. Letter from Iowa Highway Commission.

Ex. 30. Circular concerning plaintiff's open flame torch.

Ex. 31. Catalog sheet illustrating device of Billingham patent, No. 181,030.

DEFENDANTS' EXHIBITS (Paper)

Ex. A. Toledo Pressed Steel Company circular.

Ex. F1. Almond drawing with letters of its patent.

Ex. K. Drawing — defendant's flare complained of — Equity No. 1408 (Bolser).

Ex. L. Drawing — defendant's flare complained of — Equity No. 1412 (Kari-Keen).

Ex. M. Bolser circular.

Ex. N. Book of Patents, — including only the following:

Jones et al	No.	56,949	August	7, 1866
Heath	No.	66,021	June	25, 1867
Dyott	No.	116,573	July	4, 1871
Hathaway	No.	147,496	February	17, 1874
Billingham	No.	181,030	August	15, 1876
Reekie	No.	192,130	June	19, 1877
Almond	No.	193,796	August	7, 1877
Heston	No.	270,587	January	16, 1883
Blake	No.	453,335	June	2, 1891
Flora	No.	755,864	March	29, 1904
Rutz et al	No.	1,009,184	November	21, 1911
Kahn	No.	1,175,527	March	14, 1916
Knowles	No.	22,771	January	25, 1859
Thomas	No.	32,906	July	23, 1861
Martine	No.	35,349	May	20, 1862
Requa	No.	318,030	May	19, 1885
Wenzel	No.	577,090	February	16, 1897
Nichols	No.	1,036,514	August	12, 1912
McCloskey	No.	1,610,301	December	14, 1926
Close	No.	1,613,819	January	11, 1927

Ex. O. Whole circular of plaintiff's Exhibit 8.

Kindly deliver the above to The Wilkinson-Sloan Printing Company, Toledo, Ohio, for printing.

Please forward the following documentary Exhibits to the Clerk of the Court of Appeals for the Sixth Circuit at Cincinnati, Ohio.

Plaintiff's Exhibit 5.	Package of letters of complaint in regard to the open wick torch originally manufactured by the plaintiff.
Plaintiff's Exhibit 9	Package of complaint letters about plaintiff's torch, Exhibit 8, open flame type.
Plaintiff's Exhibit 12.	Letters of commendation from plaintiff's customers referring to device in suit.
Plaintiff's Exhibit 13.	Plaintiff's orders for torches of type in suit from Iowa.
Plaintiff's Exhibit 14.	Plaintiff's orders for torches of type in suit from other territory.
Plaintiff's Exhibit 21.	Dietz Lantern Catalog.
Defendant's Exhibit F.	Folding section drawing of Almond, Figure 1, Patent No. 193,796.

Please forward the following Exhibits to the Clerk of the Court of Appeals for the Sixth Circuit at Cincinnati, which Exhibits are physical Exhibits:

PLAINTIFF'S PHYSICAL EXHIBITS

Ex. 3-a. Plaintiff's commercial torch made under patent in suit.

Ex. 3-b. Bolser Torch — Equity 1408 (Corresponds to drawing, Exhibit 2-b).

Ex. 3-c. Kari-Keen Torch, Equity 1412 (Corresponds to drawing, Exhibit 2-c).

Ex. 28. First Toledo open flame torch made November, 1926.

Ex. 29. Second Toledo open flame torch made in July, 1928, corresponds to Exhibit 8.

Ex. 32. Model of Billingham patent, No. 181,030.

DEFENDANTS' PHYSICAL EXHIBITS

Ex. B. Old Railroad Flare.

Ex. C. Plaintiff's present commercial flare — half cut away.

Ex. D. Model — Wenzel patent, No. 577,090.

Ex. E. Model — Wenzel patent, No. 577,090 — provided with imperforate top.

Ex. G. Almond patent model — Almond Patent No. 193,796.

Ex. H. Defendant's burner with removable skirt (Bolser).

Ex. I. Defendant's burner with skirt (Bolser).

Ex. J. Defendant's flare with skirt (Bolser).

Standard Parts, Inc., and
Huebner Supply Company
By Holloway, Peppers & Romanoff,
and by Bair, Freeman & Sinclair,
Their Attorneys.

W. P. Bair,
Of Counsel.
Des Moines, Iowa.

STIPULATION

It Is Hereby Stipulated that the Record for the Court of Appeals may be made up according to the foregoing Praecipe, and that the following Exhibits may be sent up as separate Exhibits and need not be printed as part of the Record —

Plaintiff's Ex. 5. Package of letters of complaint in regard to the open wick torch originally manufactured by plaintiff.

Plaintiff's Ex. 9.	Package of complaint letters about plaintiff's torch, Exhibit 8, open flame type.
Plaintiff's Ex. 12.	Letters of commendation from plaintiff's customers referring to device in suit.
Plaintiff's Ex. 13.	Plaintiff's orders for torches of type in suit from Iowa.
Plaintiff's Ex. 14.	Plaintiff's orders for torches of type in suit from other territory.
Plaintiff's Ex. 16.	Anthes license dated August 15, 1933.
Defendant's Ex. F.	Folding section drawing of Almond, Figure 1, Patent No. 193,796.

Owen & Owen,
Attorneys for Plaintiff,

The Toledo Pressed Steel Company
Bair, Freeman & Sinclair, and
Holloway, Peppers & Romanoff,
Attorneys for Defendants
Standard Parts, Inc. and
Huebner Supply Company.

STIPULATION

(Filed October 23, 1935)

It is hereby stipulated between the parties hereto that the cuts contained in the circulars bound in the appeal record at page 154 are the same as those which appear in the circular attached to plaintiff's Interrogatories filed on March 9th, 1934, in the case of The Toledo Pressed Steel Company vs. Huebner Supply Company, Equity, No. 1412, and that the circulars first referred to herein may be used in place of the circulars attached to said Interrogatories.

The Toledo Pressed Steel Company,
Plaintiff,

By Owen & Owen,
Its Attorneys.

Toledo, Ohio .....

Standard Parts, Inc.,
and
Huebner Supply Company,

By Bair, Freeman & Sinclair,
By Holloway, Peppers & Romanoff,
Their Attorneys.

Toledo, Ohio .....

Aproved this 23rd day of October, 1935.

Geo. P. Hahn,
United States District Judge.

ORDER

(Filed October 23, 1935)

Upon application of defendants, and it appearing to the Court that the printer is unable to prepare the record within the statutory time, it is ordered that the time for filing of the transcript of record in the Circuit Court of Appeals for the Sixth District, at Cincinnati, be and the same hereby is extended to November 27th, 1935.

Geo. P. Hahn,

United States District Judge.

Dated: October 22nd, 1935.

Approved:—

Owen & Owen,

Attorneys for Plaintiff.

.....

.....

Attorneys for Defendants.

CERTIFICATE OF CLERK

Northern District of Ohio, ss.

I, F. J. Denzler, Clerk of the United States District Court within and for said district, do hereby certify that the foregoing printed pages contain a full, true and complete copy of the records and all proceedings in these causes, including the petitions for appeal, assignments of errors, orders allowing appeal and the bonds on appeal, in accordance with the consolidated praecipe for transcript filed herein, the originals of which, except certain exhibits withdrawn by leave of Court, remain in my custody as Clerk of said Court.

There are also attached to and transmitted herewith the citations issued and allowed herein.

In testimony whereof, I have hereunto signed my name and affixed the seal of said Court, at Toledo, in said district, this .....day of October, A. D., 193[illegible] and in the 160th year of the Independence of the United States of America.

F. J. Denzler,
Clerk.

(Seal)

By K. V. Wilson,
Deputy Clerk.

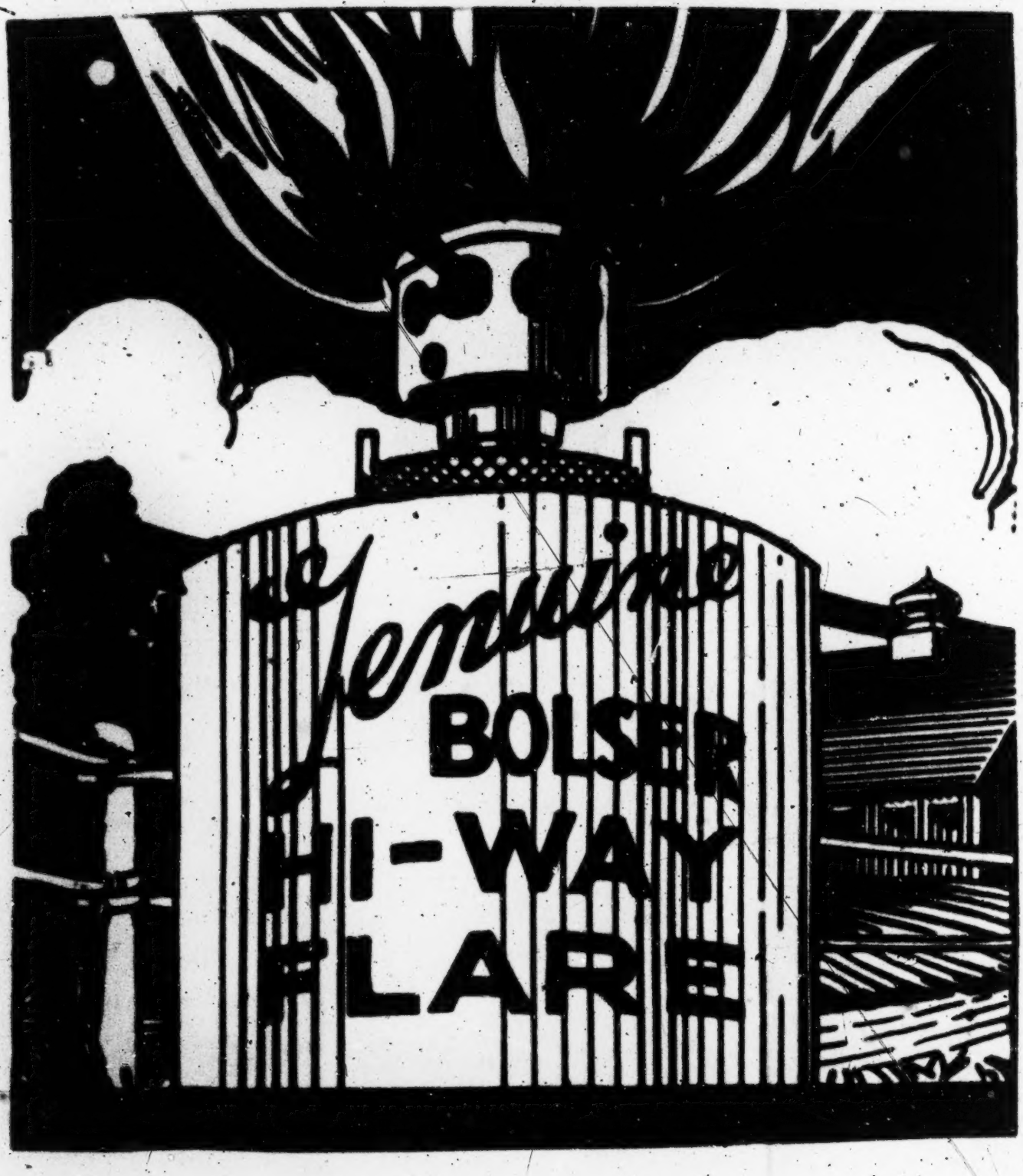


Exhibit B - attached to
plaintiff's Interrogatories - Equity No. 1408

APPROVED!

Approved by states of Iowa, Minnesota, Wisconsin, Ohio and other states having flare laws.

PROTECT YOURSELF AND OTHERS WITH THE

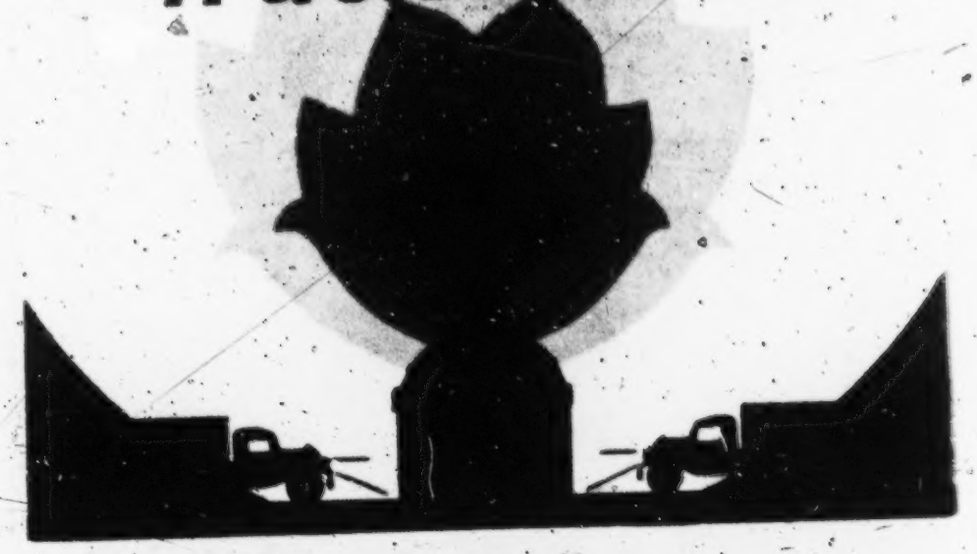


Distributed by

EXHIBIT "B"
Attached to Plaintiff's Interrogatories
Equity No. 1412
Stipulation Filed October 23, 1935
(See Page 150)

Printed in U. S. A.

Kari-Keen
Truck Flares



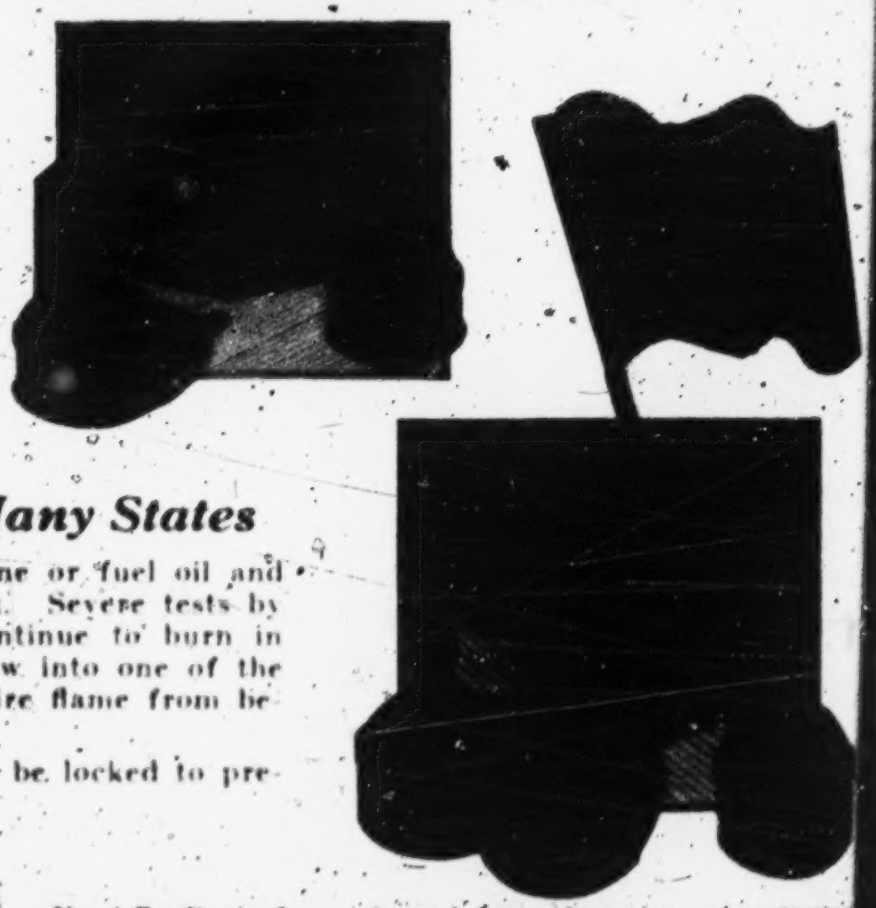
THE PREVENTER OF ACCIDENTS ON HIGHWAYS

SAFETY ON THE HIGHWAYS!

New Laws in Many States and Some Large Liability Insurance Companies Are Now Requiring that All Trucks Carry Flares.

Kari-Keen TRUCK FLARES . . AND FLAGS

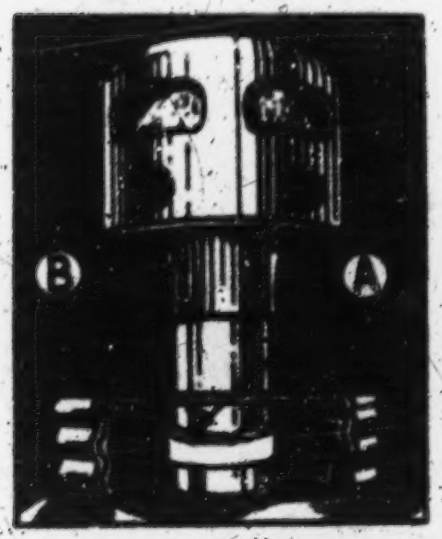
Provide This Protection and Safety to the Truck Operator at the Lowest Possible Cost.



Kari-Keen Flares Approved in Many States

The new burner generates a gas from the kerosene or fuel oil and only the gas burns. This adds long life to the wick. Severe tests by State Engineers show the Kari-Keen Flare will continue to burn in high winds but may be extinguished by a quick blow into one of the burner openings. Ventilated wick tube prevents entire flame from becoming too hot to handle.

The steel case keeps them clean and dry and may be locked to prevent theft or loss.



Kerosene burning flares for carrying on trucks must have an air vent to prevent the forcing of oil out through the wick from expansion of oil and gases within when carried in the hot sun. Please note the specially constructed air vent as shown in "A" in the accompanying illustration, which also prevents any oil from splashing out when bounced over rough roads. Any oil which splashes up through the vent is deflected into the air space "B" and drains back into the flare.

This is an exclusive feature on Kari-Keen Truck Flares, and is one of the most important.

No. 1-B Single flare unit used for replacement and contractor's warning torch. Burning time about 10 hours. Shipping weight per unit, 14 oz. Each $1.6

No. 2-B Two flares and steel carrying case. Burning time about 10 hours. Shipping weight, carton of 6 kits, 30 lbs. Per kit $2.7

No. 2-B-F—Same as No. 2-B but includes two 13x18 inch red flags with collapsible steel staffs. Shipping weight, carton of 6 kits, 39 lbs. Per kit $3.7

No. 3-B—Three flares and steel carrying case. Burning time about 10 hours. Shipping weight, carton of 6 kits, 42 lbs. Per kit $4.8

No. 3-B-F—Same as No. 3-B but includes three red flags, 20x20 inches, with collapsible steel staffs. Shipping weight, per carton of 6 kits, 58 lbs. Per kit $5.1

Extra Flags are available for either the No. 2 or No. 3 kits. Weight each, 10 oz. Each ..... $

SMALL FLARES FOR AUTOMOBILES

No. 2-A-B—Two flares in steel case, 4½x4½x9 inches. Burning time about 4 hours. Shipping weight per kit, 2½ lbs. Per kit $2.2

KARI-KEEN MANUFACTURING COMPANY • • • SIOUX CITY, IOWA

155

No. 1,732,708
Withrow and Close

PLAINTIFF'S EXHIBIT 1.

MAIL DIVISION
Form No. 35
SEP 12 35
PATENT OFFICE

District Court of the United States

Eastern DISTRICT OF Michigan

HONORABLE COMMISSIONER OF PATENTS,
Washington, D. C.

SIR:

In compliance with the Act of February 18, 1922 (42 Stat. L. 392), you are advised that there was filed on the ninth day of September, 1935 in this court an action, suit, or proceeding No. 7203, entitled:

Name The Toledo Pressed Steel Company, Plaintiff,

Address Toledo, Ohio

versus

Name Keller Tractor & Equipment Company, Defendant

Address Detroit, Michigan.

brought upon the following patents:

	PATENT NO.	DATE OF PATENT	PATENTEE
1	1,732,708	October 22, 1929	Toledo Pressed Steel Company
2			
3			
4			
5			

In the above-entitled case, on the day of , 193 , the following patents have been included by (insert amendment, answer, cross bill, or other pleading):

	PATENT NO.	DATE OF PATENT	PATENTEE
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued:

IN WITNESS WHEREOF I have affixed my hand this ninth day of September, 1935, at Detroit, Michigan.

Clerk of said Court.

156

No. 1,732,708

Withrow and Clos

PLAINTIFF'S EXHIBIT 1.

Oct. 22, 1929. J. E. WITHROW ET AL 1,732,708

BURNER

Filed Dec. 26, 1928

Fig. 1

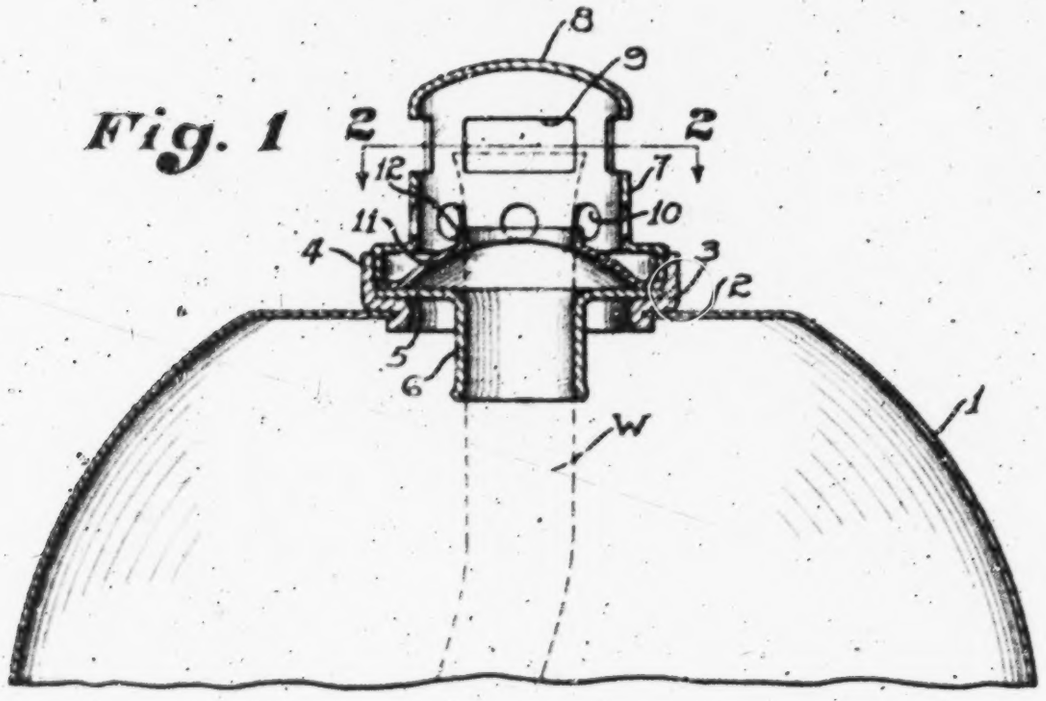


Fig. 2

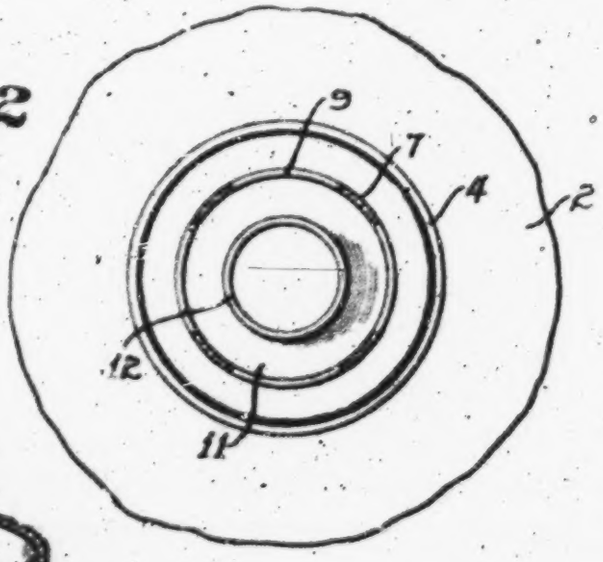
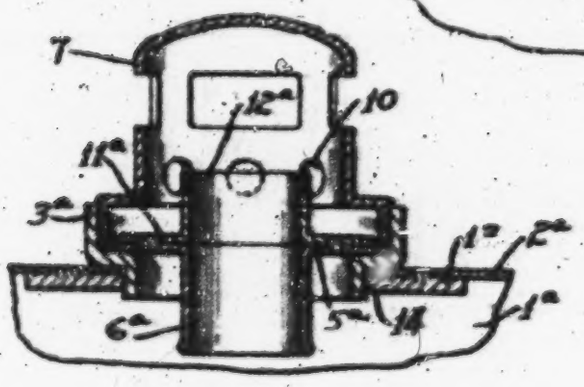


Fig. 3



Inventors

Joseph E. Withrow

Lyman W. Close

By Olson & Olson

Attorneys

Patented Oct. 22, 1929 1,732,708

UNITED STATES PATENT OFFICE

JOSEPH E. WITHROW AND LYMAN W. CLOSE, OF TOLEDO, OHIO, ASSIGNORS TO THE TOLEDO PRESSED STEEL COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO

BURNER

Application filed December 26, 1928. Serial No. 328,482.

This invention relates to street torches, such as are commonly used for illuminating road obstructions, and usually referred to as construction torches, but more particularly to devices for increasing the efficiency of such torches and militating against extinguishment of the torch flame, and an object is to provide a simple and efficient attachment for torches of the above character for increasing the efficiency thereof and materially reducing the liability of extinguishment of the flame by high winds. Another object is to provide a burner so constructed and arranged that liability of extinguishment of the flame by high winds or by rain is reduced to a minimum. Further objects are to provide a device of the above character which may be inexpensively manufactured and has the new and improved features of construction hereinafter described.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a vertical sectional elevation of a torch with the device applied thereto;

Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a vertical sectional elevation of an alternate form of burner.

The illustrated embodiment of the invention comprises a sheet metal torch 1 of substantially frusto-spherical shape having an opening for a wick in its upper end 2. Crimped over the edges of such opening is a member 3 having an outwardly extending annular flange 4, which is internally threaded. Resting on the shelf formed by the member 3 is a disc like member 5 having a central tubular extension 6, which projects inside of the torch body 1 a substantial distance. A wick W is adapted to extend through the extension 6 and to be held in position thereby.

Screwed onto the threads of the annular flange 4 is a cap 7, which extends outwardly from the flange 4, and then upwardly. The upper wall 8 of the cap 7 is imperforate, and as shown, is dome shaped. Formed in the side walls of the cap beneath the end wall 8 is a series of relatively large rectangular openings 9 through which the flame of the torch passes. Beneath the openings 9 are series of relatively small air ports 10, through which air passes to the inside of the cap for the torch flame. It will be observed that the cap is of such dimensions that the side walls thereof are spaced from the sides and end of the wick W.

Resting upon the disc-shaped member 5 is an arched disc 11 having an upwardly extending annular flange 12 terminating in the region of the air ports 10. As shown, the upper end of the extension 12 covers approximately one-third of the area of the ports 10. The function of the disc 11 is to prevent the air entering the inside of the cap 7 from cooling the wick W to such an extent that the temperature of the oil passing up the wick is reduced below the desired point.

When the outer end of the wick W is lighted the oil passing up the wick by capillary action is heated, thereby maintaining the oil in the region of the outer end of the wick at the proper flashing point. This heating of the wick is facilitated by the reflection of heat from the dome-shaped cap and by conduction to wick-holding collars 12 and 6 from their supporting flanges, flange 11 receiving reflected heat and being in contact with the lower edge of the heated cap. Air inlet openings 10 being above the lower edge of the cap leaves a space within the cap and above the flange of the wick holder for comparatively quiescent air. This quiescent layer of air in contact with the wick holder and the restriction of inlet ports to admit to the wick and holder only such air as is needed for combustion aids in maintaining the heat of the wick holder and wick. This militates against extinguishing the flame by high winds. Sufficient cool outer air is supplied to the end portion of the wick through the ports 10 for securing a satisfactory flame, and the latter extends through the openings 9 to provide a satisfactory signal. It has been found that with the above described construction and arrangement, the oil consumption is materially decreased. It is also found that the amount of wick used is likewise decreased. Another outstanding advantage resides in reducing the liability of extinguishing the flame by high winds or rain.

In the embodiment shown on Fig. 3, there is fixed, as by welding to the torch body 1^a, a ring 13 which surrounds the opening in the top wall 2^a and the walls of the opening are formed with screw threads 14 to receive a flanged member 3^a. This permits the burner to be attached to or detached from the torch as a unit. In this form the disc 5^a has an inwardly extending wick-receiving tube 6^a, and fixed to the upper surface of the disc 5^a is a disc 11^a provided with an upwardly extending flange or tube 12^a. The upper end of the flange 12^a covers approximately one half of the openings 10 of the cap 7. It will be understood that the arrangement of tubes 6^a and 12^a may be used to advantage in the form shown in Fig. 1.

While we have shown and described constructions which admirably fulfill the objects primarily enumerated, it is to be understood that the above description is given by way of illustration and not of limitation, and numerous changes in details of construction and arrangement may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What we claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a torch body having an opening at its upper end, a wick-receiving tube extending into said opening, and a cap disposed on the outer side of said torch body to enclose the outer end of the wick, said cap having an imperforate upper wall, lateral flame openings, and air openings below the flame openings.

2. In a device of the class described, a torch body having an opening for a wick, and a flame guard for said wick mounted on the outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports.

3. In a device of the class described, a torch body having an opening for a wick, an outwardly extending flange in the region of said opening, and a flame guard detachably connected to said flange and comprising a cap provided with side flame openings and air ports.

4. In a device of the class described, a torch body having a wick opening, an outwardly projecting flange in the region of said opening, a wick-receiving tube extending inside of said torch body, and a guard for the outer end of the wick engaging said flange, said guard comprising a removable cap having an imperforate top, side flame openings and air openings.

5. In a device of the class described, a construction torch having an opening in its upper end for a wick, means to hold the wick in place, and a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having an imperforate top wall and side flame and air openings.

6. In a device of the class described, a torch body having a wick-opening, a tube for receiving the wick and adapted to extend inside of the torch body, an outwardly extending flange in the region of said wick-opening, and a cap connected to said flange and having an imperforate top wall, said cap having a flame opening adjacent its outer end and an air port beneath said flame opening.

7. In a device of the class described, a torch body having a wick-opening, a cap for enclosing the outer end of the wick but spaced from the sides thereof, an imperforate end wall for said cap, said cap having a series of flame openings and a series of air ports beneath the flame openings, and a disc adapted to embrace the wick and having a flanged upper portion disposed in the region of said air ports.

8. In a device of the class described, a torch body having a wick opening, an outwardly extending flange in the region of said opening, a wick tube extending inside of said torch body, a cap adapted to enclose the outer end of the wick and engaging said flange, an imeprforate end wall for said cap, said cap having a series of flame openings and a series of air ports beneath said flame openings, and a flanged disc adapted to embrace the wick and having its upper end disposed adjacent said air ports.

9. In a device of the class described, a burner unit adapted for attachment to a torch, said unit comprising a supporting member for engagement with a torch body, a wick-holding member having oppositely extending flange portions for embracing a wick, and a cap superposed upon said supporting member, said cap being provided with vertically spaced air-inlet and flame-outlet openings.

10. In a device of the class described, a burner unit adapted for attachment to a torch, said unit comprising a supporting member for engagement with a torch body, a wick-holding member having oppositely extending flange portions for embracing a wick, and a cap superposed upon said supporting member, said cap being provided with vertically spaced air-inlet and flame-outlet openings, the upper end portion of one of said flange portions covering approximately one-half of said air-inlet openings.

11. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a supporting and heat-receiving flange, and means enclosing a space above said flange and surrounding the wick, except for provision for lateral exit of flame and restricted entrance of air for combustion.

12. A burner for a construction torch

adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a lateral flange, and a cap enclosing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange.

13. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a laterally extending flange and a cap over the wick, the cap having an imperforate, dome-shaped top wall, a lateral flame opening approximately even with the top of the wick and a smaller opening for the inlet of air lower than the flame opening and above the lower edge of the cap, said lower edge being in heat-transferring relation to said flange.

14. A construction torch adapted to emit a luminescent flame and comprising a fuel receptacle with an opening in its top, a wick extending upward through said opening, a wick holder having a collar holding the wick and a flange resting in said opening, and a cap screwed into said opening and against said flange, the cap surrounding and being opened from the end of said wick, having an imperforate, dome-shaped upper wall, lateral space for the exit of flame adjacent said wall, and restricted inlet for air beneath said space.

In testimony whereof we have hereunto signed our names to this specification.

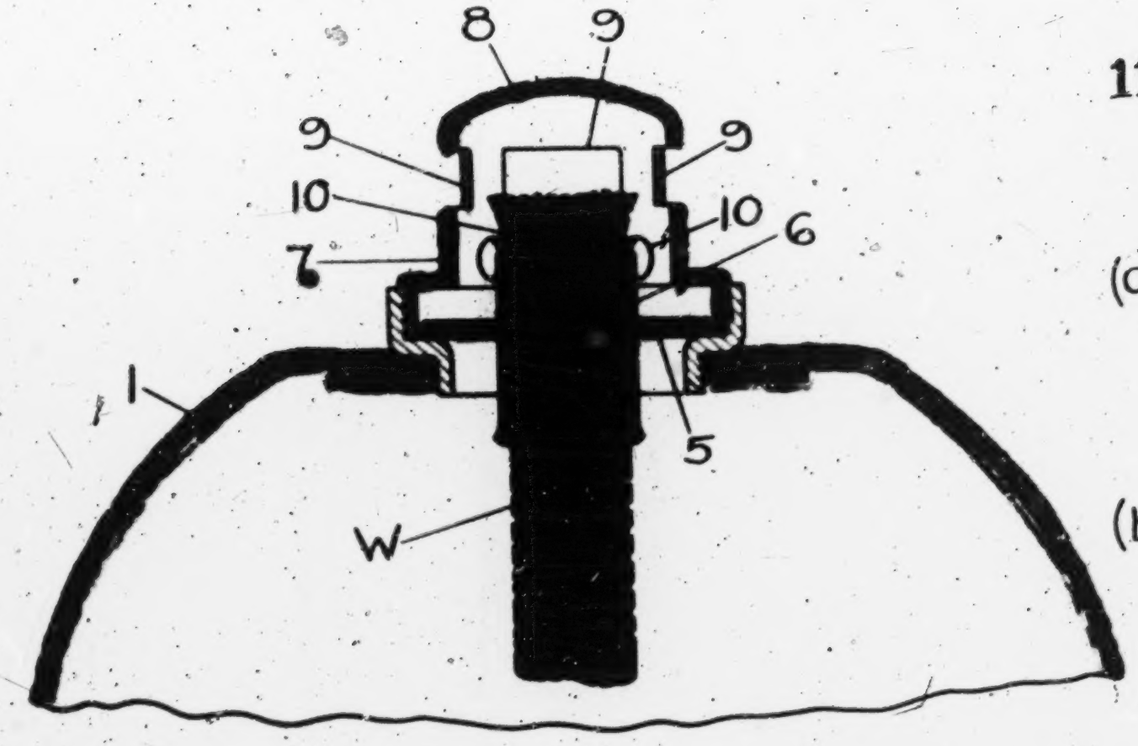
J. E. WITHROW.
LYMAN W. CLOSE

~~1928~~
1929

CONTENTS:

1. Application ... 2 papers.
2. Injunction ... JUL 24 1929
3. Affidavit ... SEP - 3 1929
4. Notice of Suit ... Nov. 14 1929
5. Notice of Suit ... Nov. 2[illegible] 1934
6. Notice of Suit ... Jan 11 1934
7. Notice of Suit ... Jan 29 1934
8. Notice of Suit ... July 1 1935
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FIG. 3 OF PATENT IN SUIT



2. In a device of the class described,
(a) a torch body (1) having an opening for a wick W,
(b) and a flame guard (7) for said wick mounted on the outside of said torch body, said guard including
a cap provided with an imperforate top wall (8) and lateral flame openings (9) adapted to emit a luminescent flame,
and air ports (10).

11. A burner for a construction torch adapted to emit a luminescent flame and comprising
(a) a wick holder (6) having
a portion in contact with the wick
and a supporting and heat receiving flange (5),
(b) and means (7) enclosing a space above said flange and surrounding the wick, except
for provision (9) for lateral exit of flame and restricted entrance of air (10) for combustion.

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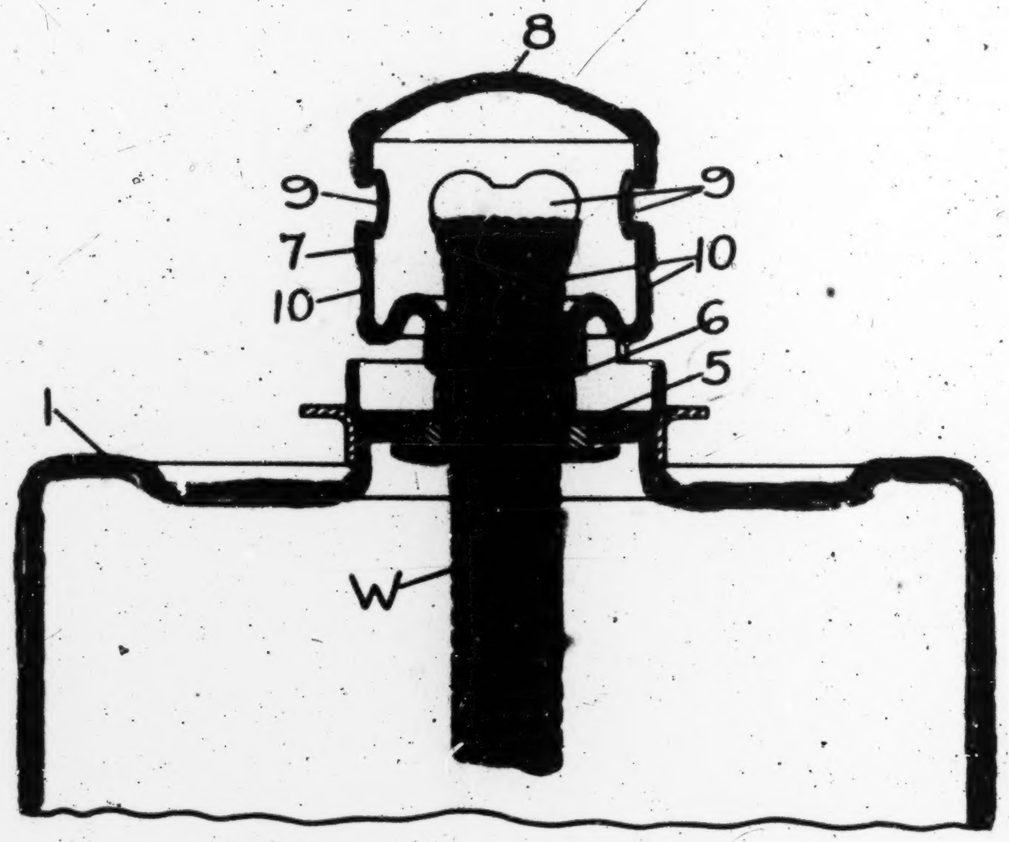
PLAINTIFF'S EXHIBIT 2-A

Drawing — Figure 3 of Patent in Suit — With Terms of Claims 2 and 11 Applied

EXHIBIT 2b

DEFENDANTS TORCH IN CASE 1408
(BOLSER)

2. In a device of the class described,
(a) a torch body (1) having an opening for a wick (W)
(b) and a flame guard (7) for said wick mounted on the outside of said torch body, said guard including
a cap provided with an imperforate top wall (8) and lateral flame openings (9) adapted to emit a luminescent flame,
and air ports (10).



11. A burner for a construction torch adapted to emit a luminescent flame and comprising
(a) a wick holder (6) having a portion in contact with the wick and a supporting and heat receiving flange (5),
(b) and means (7) enclosing a space above said flange and surrounding the wick, except
for provision (9) for lateral exit of flame and restricted entrance of air (10) for combustion.

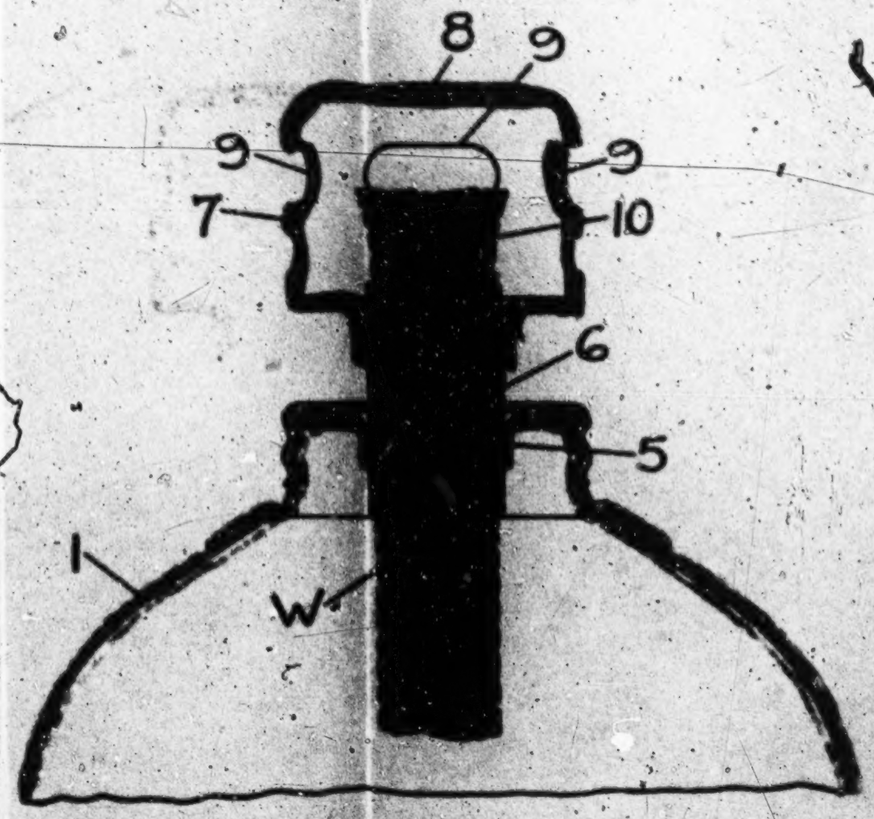
PLAINTIFF'S EXHIBIT 2-B

**Drawing of Defendant's Torch in Equity 1408 (Bolser)
With Claims 2 and 11 Applied**

EXHIBIT 2c

DEFENDANTS TORCH IN CASE 1412
(K-K)

2. In a device of the class described,
(a) a torch body (1) having an opening for a wick (W),
(b) and a flame guard (7) for said wick mounted on the outside of said torch body, said guard including
a cap provided with an imperforate top wall (8) and lateral flame openings (9) adapted to emit a luminescent flame,
and air ports (10).



11. A burner for a construction torch adapted to emit a luminescent flame and comprising
(a) a wick holder (6) having a portion in contact with the wick
and a supporting and heat receiving flange (5),
(b) and means (7) enclosing a space above said flange and surrounding the wick, except
for provision (9) for lateral exit of flame and restricted entrance of air (10) for combustion.

PLAINTIFF'S EXHIBIT 2-C

Drawing of Defendant's Torch in Equity 1412 (Kari-Kean) With Claims 2 and 11 Applied

PLAINTIFF'S EXHIBIT 4 **163**

Circular of Plaintiff's First Flame Torch—(4 Pages)
Extending Into Fuel Tank

THE TOLEDO PRESSED STEEL CO.

TOLEDO, OHIO

CASE No. 1408 1412
PLAINTIFF'S EXHIBIT
No. 11



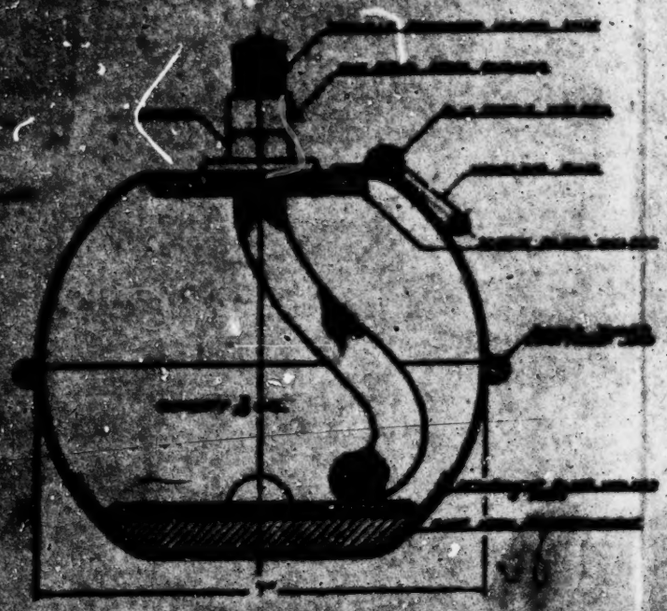
2

THE TOLEDO TORCH

THE TOLEDO TORCH is an improved, open flame warning signal for use at night on all street and highway obstructions.

ITS CONSTRUCTION

The main body is composed of two pressed steel hemispheres, with [illegible] rims. These are joined together with a double seamed, leak-proof joint making one complete sphere.



The bracket consists of cast iron counter-weight electrically welded to [illegible]. The top is provided with a swing-joint bracket which carries the burner. This bracket has a large sliding bolt, in a heavy screw plate, [illegible] the desirable position of the burner.

[illegible] provided for easy [illegible] mak-

[illegible] cop-
[illegible] and
[illegible] of the

ITS USE

Due to the counterweight in the bottom, THE TOLEDO TORCH is self righting. It can, therefore, be placed at any point on an obstructed road without support, and does away with all supplementary barricades.

It is placed directly in holes in the pavement or between tracks, or along the edge of large holes, ditches, or any obstruction that should be guarded.



Among the most important advantages are, first greater protection of the job, the public and yourself; second, greater economy in use and maintenance; and third elimination of the theft hazard, both of the warning signal itself, and or *ipment about the job.

THE ADVANTAGES TO YOU

Thousands of users of this improved protection, testify to the reality of these advantages.

The open flame illuminates and shows what the obstruction is.



This flame can be seen from a great distance and gives a timely warning. It is not mistaken for automobile tail lights, or other incidental lights that appear on the streets, and it carries a message of universal understanding.

Being made of pressed steel the torch is unbreakable. There are no globes to clean or replace. Its maintenance is reduced to simply filling with oil and adjusting the wick.

With proper handling, wicks will last for many [illegible] of constant use. When a wick becomes too short to reach the bottom of the [illegible] it should be replaced with a new standard wick which can be secured direct from us or through our distributors.

THE TOLEDO TORCH can be operated on any kind of burning oil, from light furnace oil to lard oil. Economy can be effected through the use of the cheaper grades.

THE TOLEDO TORCH is adaptable to only one use, namely, protection at night on construction work, and is therefor not subject to theft.

WHY IT IS SAFE TO USE THE TOLEDO TORCH

Being self-righting the flame of the TOLEDO TORCH is always on top. It cannot tip over and ignite inflammable material. The self righting action returns it to location when bumped accidentally by vehicles. The large wick assures a vigorous flame which withstands wind and rain.

That the completeness of its performance more than fulfills the spirit of requirements of state or municipality codes, regarding protection of road obstructions, is attested by the ever increasing use of them on public work by highway commissions and engineers.

THE PRICE OF THE TOLEDO TORCH

Extensive use with increased production has permitted us to reduce the price of this necessity to $1.50 each, $18.00 per dozen or $200.00 per gross, F. O. B. Toledo, Ohio. Prices of larger quantities will be furnished on application.

Additional wicks, cut and ready for use may be secured direct from us post paid, or through our distributors at $ .15 each, $1.80 per dozen.

Every time you buy any other kind of warning signal, you are paying for a TOLEDO TORCH. Why not have the TOLEDO TORCH when you pay for it, and eliminate further purchases?

Some one near you is probably using TOLEDO TORCHES now. If you have seen them our address is all you need. If you have not seen them, a trial dozen will prove a revelation to you.

ORDER NOW while the thought is in your mind.

The Toledo Pressed Steel Co.

12th STREET & WOODRUFF AVE.

Toledo, Ohio

PLAINTIFF'S EXHIBIT NO. 6

(Filed May 10, 1935)

(Yellow Tag sent out by plaintiff with old torches recommending 1½ inch wick exposure)

THE TOLEDO TORCH

normal length of exposed wick is about 1½ inches. Extend the wick further for heavy weather conditions.

Do not spread or trim the wick.

THE TOLEDO PRESSED STEEL CO.
TOLEDO, OHIO

(Reverse Side):

THE TOLEDO TORCH

It is not necessary to entirely remove the wick when filling.

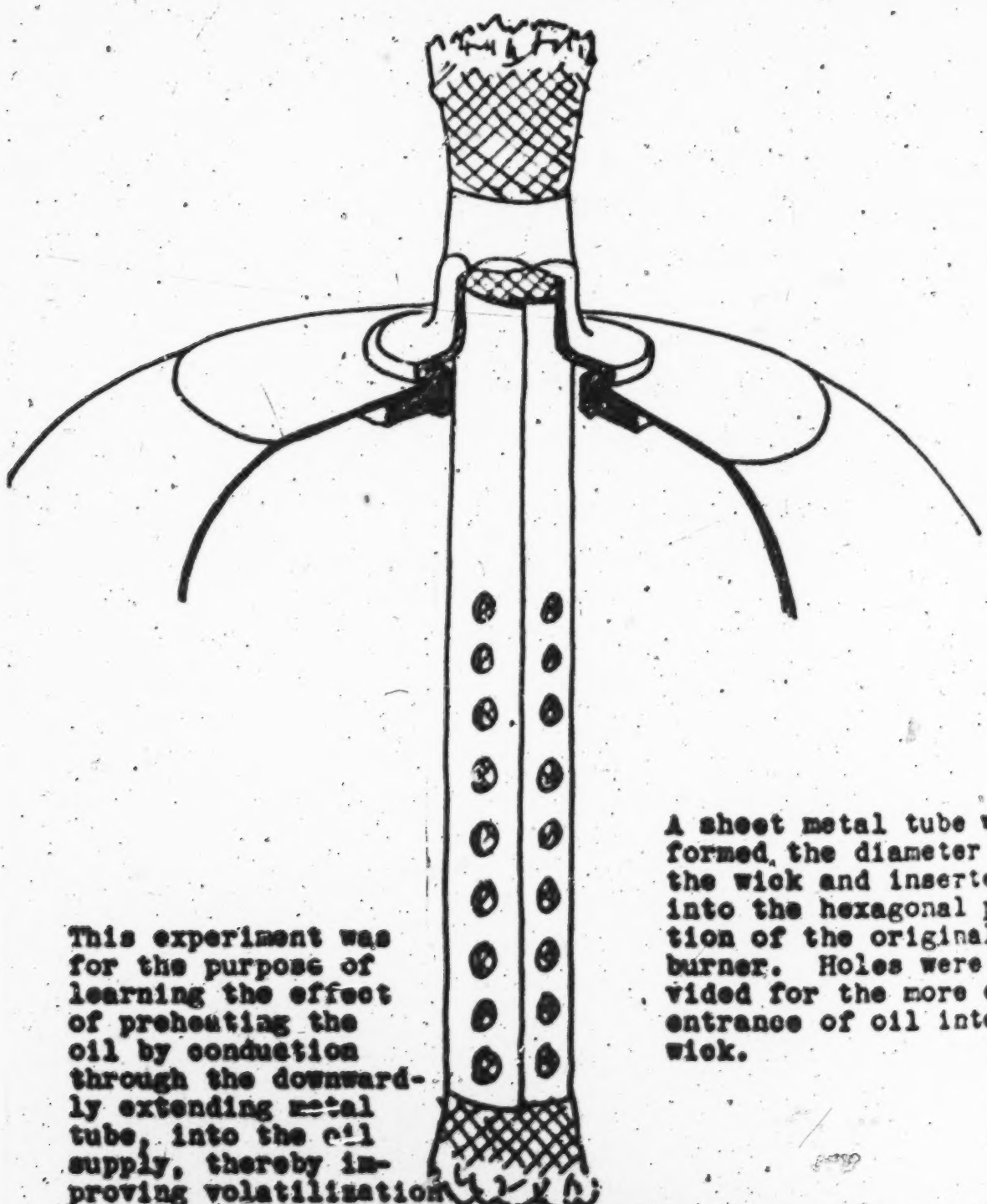
Use good oil. A light furnace oil of good burning quality or a good grade of kerosene should be used.

THE TOLEDO PRESSED STEEL CO.
TOLEDO, OHIO.

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PLAINTIFF'S EXHIBIT 7

Sketch Showing Experimental Burner with Long Tube



A sheet metal tube was formed the diameter of the wick and inserted into the hexagonal portion of the original burner. Holes were provided for the more easy entrance of oil into the wick.

This experiment was for the purpose of learning the effect of preheating the oil by conduction through the downwardly extending metal tube, into the oil supply, thereby improving volatilization and consequently improving combustion and making the flame more reliable in cold and windy weather.

It had merit but was impractical to produce. This taught us that preheating oil was desirable.

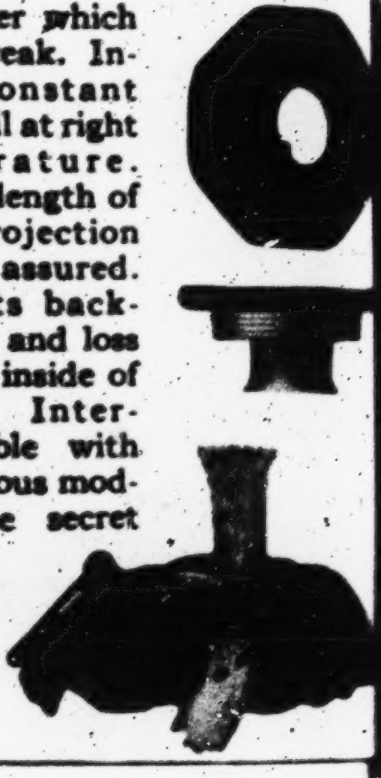
PLAINTIFF'S EXHIBIT 8

Part of Circular Showing Open Flame Torch on Which Plaintiff Went Into Production in 1928. Actual Device is Shown in Physical Exhibit 29.

IMPROVED BURNER

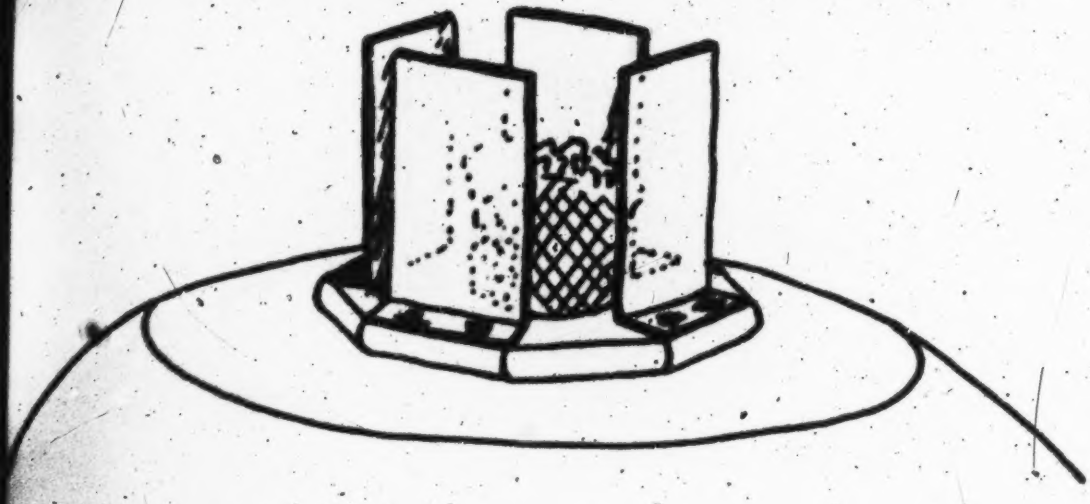
All TOLEDO TORCHES are now equipped with a burner which greatly improves its performance. No projecting parts to break. Insures constant flow of oil at right temperature. Correct length of wick projection always assured. Prevents backslippage and loss of wick inside of torch. Interchangeable with all previous models. The secret of all-weather dependability.





PLAINTIFF'S EXHIBIT 10-A

Drawing of Experimental Torch Tried by Plaintiff

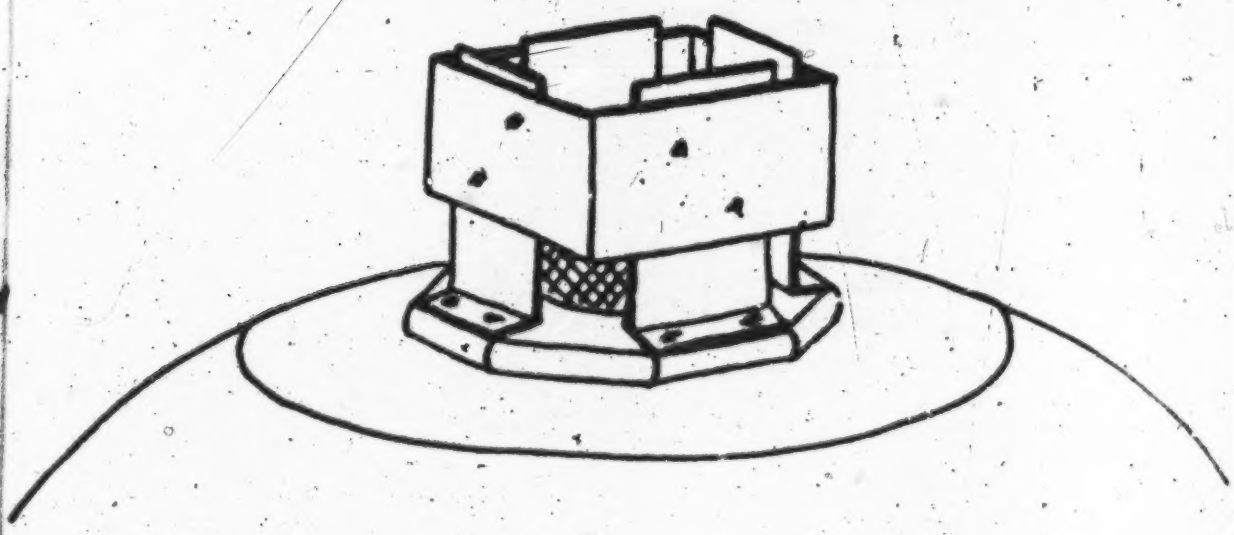


Sheet metal angles were formed up with one short leg and one long one. The Short leg was spot welded to the top of the flat type burner in such a position to form with the long leg of each angle, a portion of a series of baffles surrounding the wick.

The illustration shows four of these used. Similar tests were made with three, five and six angles arranged in a similar manner to that shown above.

PLAINTIFF'S EXHIBIT 10-B

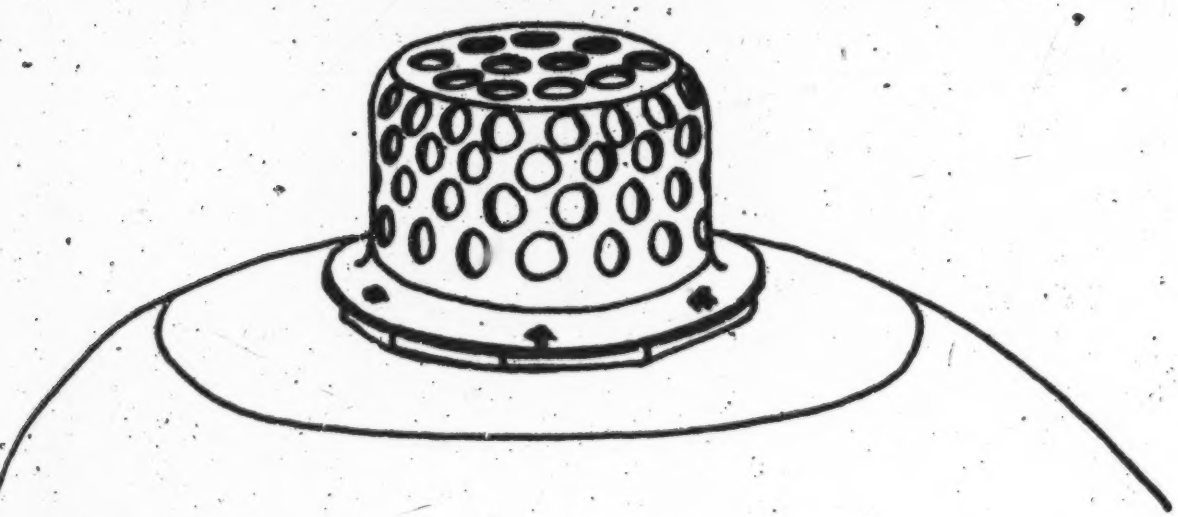
Drawing of Experimental Torch Tried by Plaintiff



To prevent the easy extinguishing of the flame by the wind when simply straight pieces of metal were placed about the wick, a band around them was tried out. It was an improvement but not practical to make.

PLAINTIFF'S EXHIBIT 10-C

Drawing of Experimental Torch Tried by Plaintiff

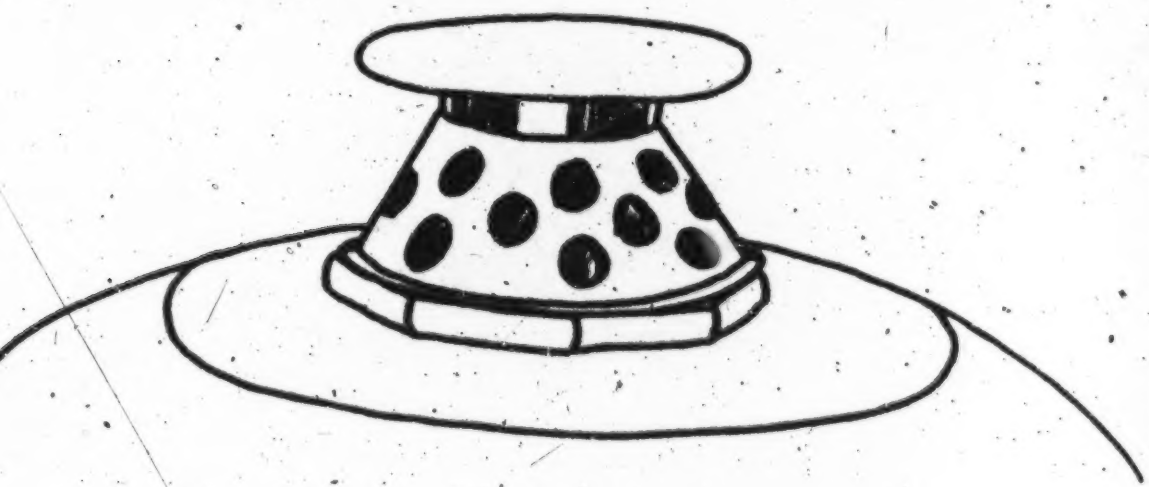


A cap was made of suitable size to fasten to the top of the flat type burner and was drilled full of holes as shown.

Tests proved the merit of enclosing the wick in such a manner but further improvement was necessary to improve ability to withstand rain and wind.

PLAINTIFF'S EXHIBIT 10-D

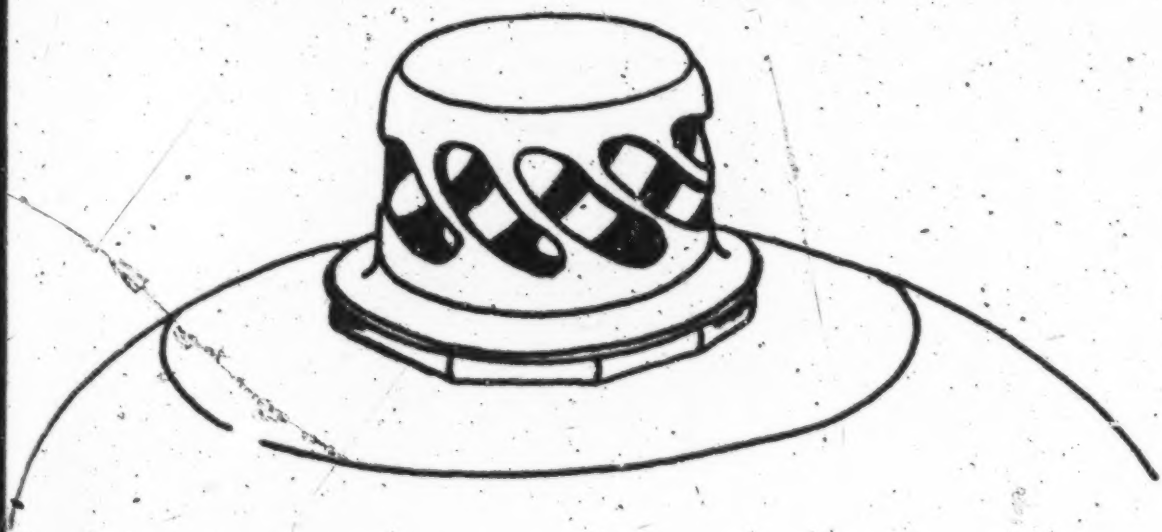
Drawing of Experimental Torch Tried by Plaintiff



A tapered shell with perforations of several different arrangements was covered by a flat disc attached to it to fend off rain.

PLAINTIFF'S EXHIBIT 10-E

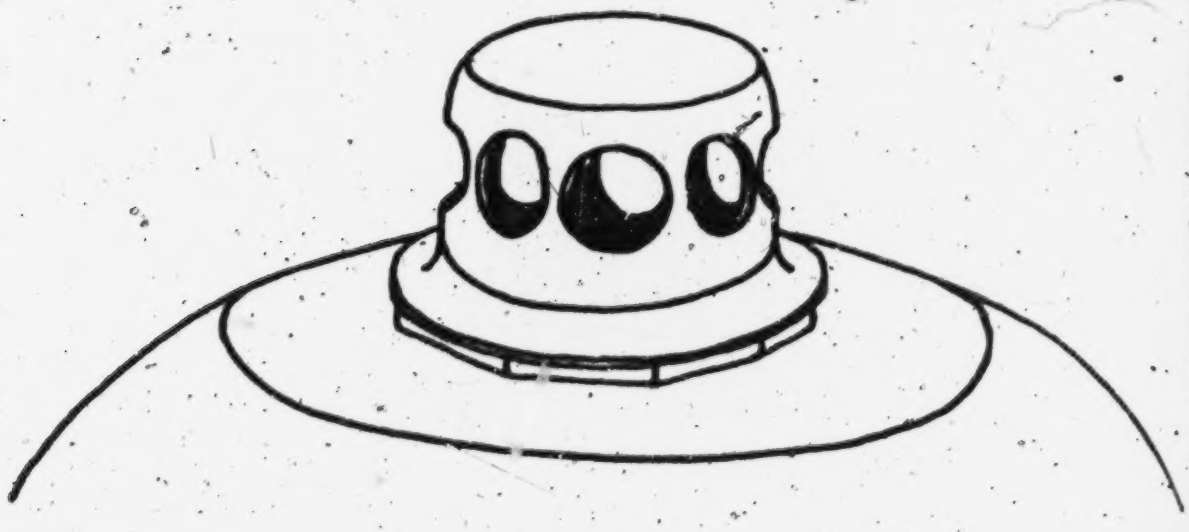
Drawing of Experimental Torch Tried by Plaintiff



Many caps of shape similar to that shown above were constructed, using different arrangements of perforations and slots in an effort to secure the best results.

PLAINTIFF'S EXHIBIT 10-F

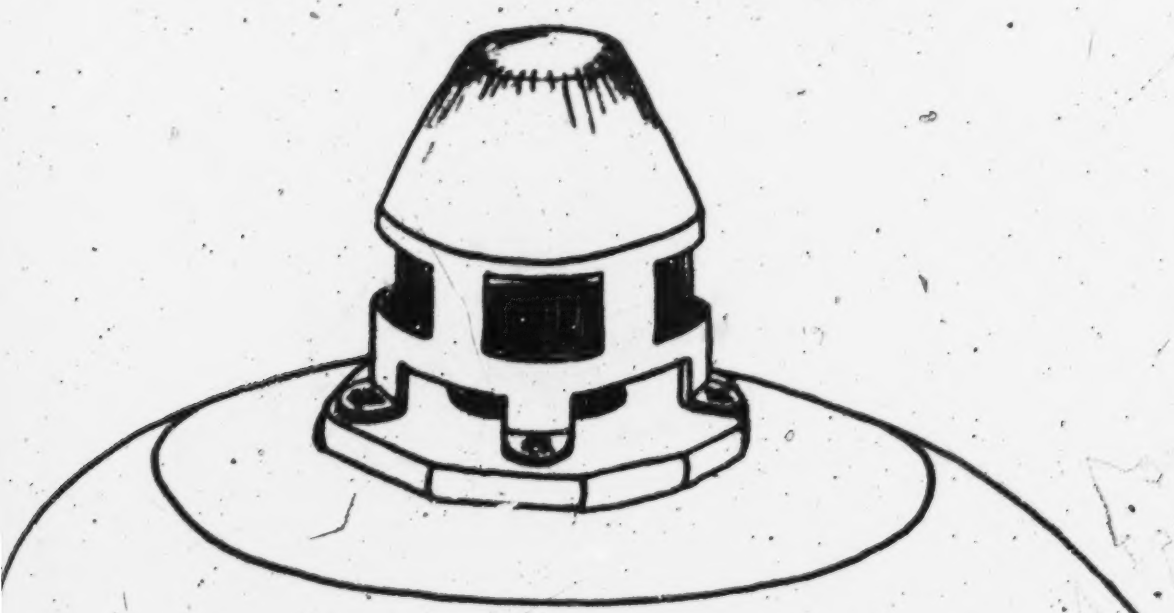
Drawing of Experimental Torch Tried by Plaintiff



Drilled holes in many different arrangements were experimented with, in addition to sawed and filed slots.

PLAINTIFF'S EXHIBIT 10-G

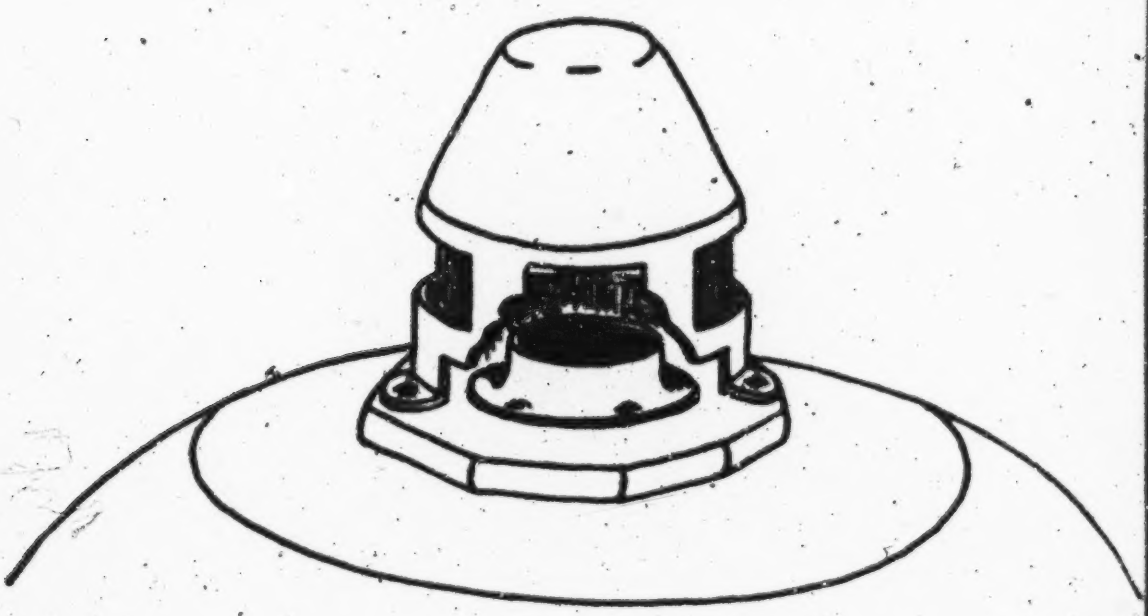
Drawing of Experimental Torch Tried by Plaintiff



Tapered shells as well as straight ones, with special attention to the shape and size of the dome above the openings, were made and attached to the flat top burner. This one with four legs attached, was affixed in position allowing an opening below the shell for the entrance of air. It demonstrated the need for secondary protection inside for the wick.

PLAINTIFF'S EXHIBIT 10-H

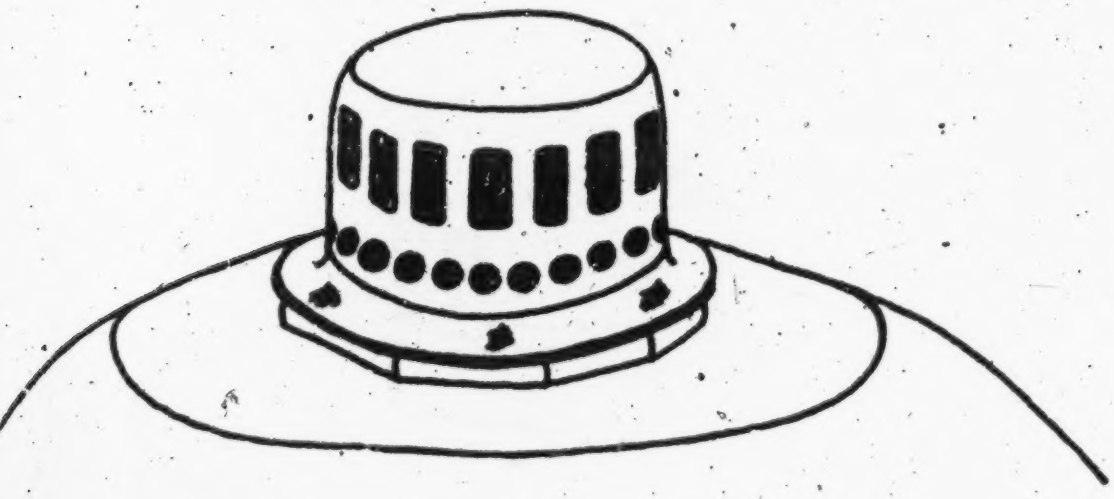
Drawing of Experimental Torch Tried by Plaintiff



The cutaway section shows the wick holder collar which was introduced as secondary protection inside the shell for the wick. Previous tests were repeated with a wick holder of this sort used in addition to the outer shells.

PLAINTIFF'S EXHIBIT 10-I

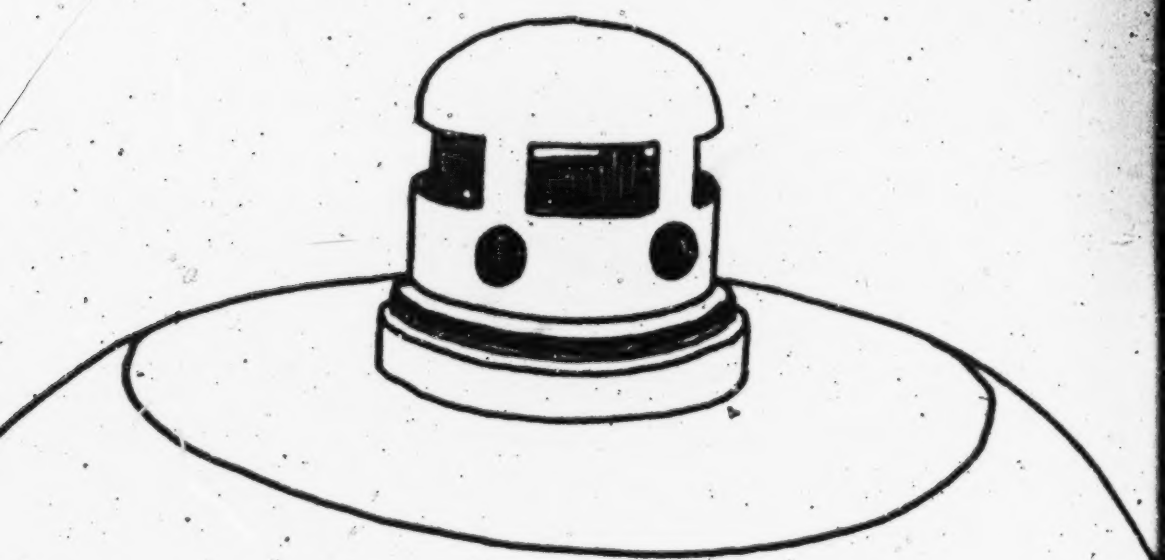
Drawing of Experimental Torch Tried by Plaintiff



The results previously obtained led to a consistent series of experiments with various arrangements of lower holes for the entrance of air and upper holes for the exit of the flame, and the use of a wick holder inside, adjusted at various heights.

PLAINTIFF'S EXHIBIT 10-J

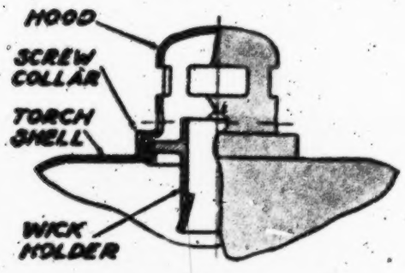
Drawing of Experimental Torch Tried by Plaintiff



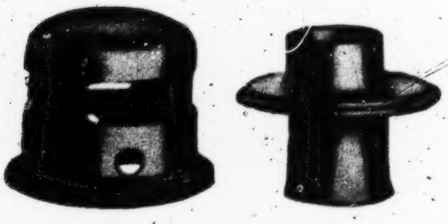
To facilitate better application of wick holder and make possible more consistent results, a screw collar and hood were turned up out of copper in substantially the shape and size shown above. Subsequent hoods turned up out of steel with various arrangements of holes and heights of wick holder resulted in the design and proportions of the present Economy Burner.

Only the TOLEDO has the efficient Economy Burner





Cross-section drawing showing the simple assembly of the Economy Burner. Easily handled by inexperienced labor.



Hood

Keeps out rain and snow. Reflects and retains heat, improving combustion. An effective windshield.

Wick Holder

Retains proper wick adjustment at all times.



Screw Collar Adapter

For use in fitting Economy Burner to old style torches. If you have older models of torches, modernize them by applying Economy burners. All burner parts may be obtained separately. We sell extra wicks at cost.

MORE than three-quarters of the state highway departments in the United States, hundreds of cities and public utilities and thousands of contractors have eliminated worry about traffic signals, have protected their liabilities and are *saving* money with "Toledo" Torches.

No other torch has the flashing, storm-proof, fuel-saving Economy Burner in so perfected a form.

50% Fuel Saving

The Economy Burner reduces oil consumption *by one-half* — it makes the Toledo Torch the most economical torch in existence.

No Wick Consumption

The cost of wicks—the labor cost of renewing them —are reduced to a negligible item. We guarantee our standard 18-inch wick, supplied with every torch, *to give constant satisfactory service for a whole year.*

Other Economies

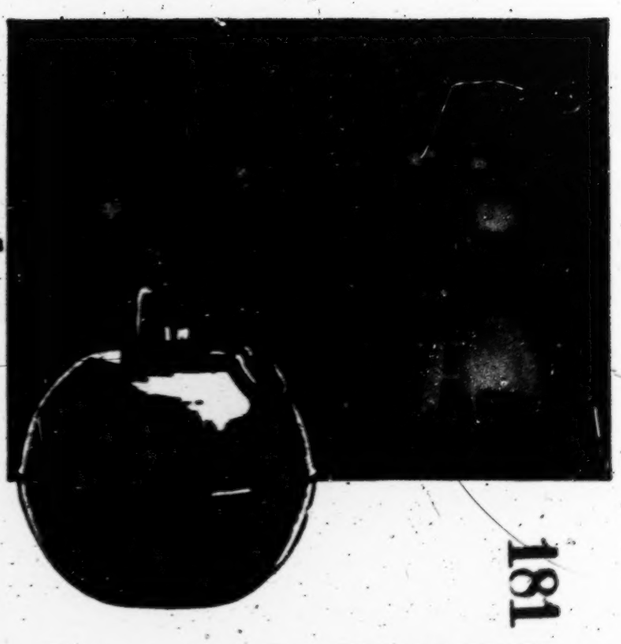
The Economy Burner prevents the wick from "bleeding" oil when first lighted. It prevents wick damage. It produces a flashing flame—*a protection in light.*

The Toledo Pressed Steel Co
TOLEDO OHIO

Save with Steel



PLAINTIFF'S EXHIBIT 11-A
Circular of Plaintiff's Construction Torch
Embodying Patented Burner in Suit



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Here are six reasons why 150,000 "Toledo" Torches are illuminating traffic hazards on highways — more than all other makes of torches combined:

1 A compelling warning instantly seen and understood by everyone. A flashing yellow flame —the color of all modern caution lights. You simply can't get by a "Toledo" Torch without seeing it.

"Better than lanterns as a public safeguard—seen a greater distance—much more conspicuous." S. K. Jones Const. Co., Memphis, Tenn.

2 They always burn—neither wind nor rain will quench them. The harder it blows the better they burn.

"Never found them not burning in the morning, in spite of severe storms at night." F. A. Flannagan, Shawnee County Highway Dept., Topeka, Kansas.

3 They're unbreakable. Their first cost is the only cost.

"No globes to get broken—we are well satisfied with Toledo Torches." Globe Const. Co., Wichita, Kansas.

4 They right themselves from any position—can't tip over—they are nimble in avoiding wheels.

"They're right there all night, every night. We fill 'em, light 'em and forget 'em." A. K. Erb, State Road Commissioner, West Virginia.

5 Foolproof and theft-proof — they're never stolen.

"Foolproof—we have no reports of any of these lights being stolen." Ticus Bros., Waynesville, N. C.

6 Economical—burn only half as much fuel as other torches. Wick consumption almost nothing.

"There is nothing on the market to equal the Toledo Torch." Roy H. Schultz, County Surveyor, Paulding, Ohio.



No other torch offers the economical, sure-fire protection that you get with the genuine TOLEDO.



"LEADER"



The ***"Leader"***: self-righting; capacity 3 quarts; Economy Burner; burns up to 48 hours on one filling; made of 20-gauge steel; halves joined by strong, double-seamed joint; black baked enamel finish; weight 5½ pounds; packed ½ dozen per box.

"CHAMPION"

The ***"Champion"***: self-righting; capacity 3 quarts; Economy Burner; burns up to 48 hours on one filling; made of 15-gauge steel; halves welded together; black baked enamel finish; weight 6½ pounds; packed ¼ dozen per box.



MODEL "T"



Designed especially for use of common carrier motor vehicles, which are required to carry torches for emergency stops at night. Approved and recommended by Public Utilities Commissions. Economy Burner. Burns 10 hours

TOLEDO TORCH with the ECONOMY BURNER

Read Directions Carefully

TOLEDO TORCH Equipped with the ECONOMY BURNER

Read Directions Carefully

Before starting to operate the TOLEDO TORCH with the ECONOMY BURNER remember that it operates on a principle, *entirely different from* all other torches. If you have never operated torch safety lights, you will have nothing to forget. If you are an old torch user, don't try to apply your past experience in operating this new Toledo Torch.

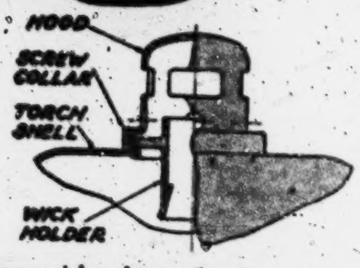


Instead of burning the oil directly, as in all other torches, this new Toledo Torch burns a mixture of air and oil vapor. The oil is vaporized by the heat generated by the flame, which is reflected and retained by the hood. The mixture is secured automatically.

In all other torches, an extremely large flame is necessary to give a fair degree of resistance to heavy weather conditions. A large flame means extravagant use of oil, and rapid burning of the wick.

Therefore, in designing the Economy Burner, we sought to utilize the smallest flame consistent with the requirements of adequate protection, in order that the minimum amount of oil might be consumed. To satisfactorily utilize this flame, a hood properly designed to make it proof against wind and rain is provided. Incidentally the hood furnishes the mixing chamber where a proper mixture is automatically maintained for all varying weather conditions.

To put the Toledo Torch into operation:



1 *Remove the Hood From the Torch.*

In its original package the new Toledo Torch will probably come to you with the hood screwed into the screw collar, in an inverted position, with the wickholder loose.

2 *Fill The Torch With Good Kerosene.*

The torch should be filled to within about one-half to three-quarters of an inch from the top. Kerosene is recommended because of its superior vaporizing properties.

3 *The Wick Should Project About 1/8 of an Inch.*

Before inserting the wick, see that it projects above the wick-holder not more than about 1/8 of an inch. This is to allow the loose ends of the new wick to burn off and equalize across the top. Old wicks with properly charred ends will not require as much projection. The lower, or longer portion of the wick-holder is provided with a prong which prevents downward movement of the wick. A twisting movement of the wick will effect the adjusting of the wick to the proper point. A very slight difference in this adjustment may make a large difference in the amount of oil consumed, so care should be taken at this point.

4 *Insert The Wick Into The Torch.*



It is well to dip the top of a new wick into the oil to insure saturation. Then insert the long end of the wick into the torch gradually, so as not to cause the oil to overflow before it is absorbed by the wick. Give it a twisting motion so it will lay out in the torch and permit the wick-holder to seat properly. A new wick before it is used will be relatively stiff and prevent flush seating of the wick holder, before the addition of the hood. After use this condition will be corrected.

5 *Attach The Hood.*

Screw the hood into the screw-collar until it seats firmly against the wick-holder flange.

6 *Ignite the Oil on the Wick Through a Flame-Port.*

The hood has four small round holes placed adjacent to the flange, and four larger rectangular holes placed above them. The round holes are the air-intakes. The rectangular holes are the flame-ports. If the torch is lighted indoors, the flame presented will appear very weak and can easily be blown out. This is no indication of its performance out-of-doors, where it will be used. Also remember that the appearance of the flame in the daytime is greatly different from its appearance at night, and what may appear to be a very insufficient signal by day, will probably prove wholly adequate when seen against the black background of night. Therefore, before adjusting the wick higher for a larger flame, see it first during the night period, on the job. If the torch is lighted out-of-doors in a strong wind, a waste or wick lighter may prove convenient. Light the torch from the windward side and give it protection until the hood becomes properly heated. *Remember, it is reflection of this heat from the hood, that vaporizes the oil*, and the vaporization must be properly started to insure continued satisfactory performance. Of course vaporization starts more slowly in cold weather than it does in warm weather, but in any event it should start properly in a few seconds. In lighting the torch the second or third time without refilling, it may require slightly longer to get the vaporization properly started due to a lower oil level.

7 *To Extinguish The Flame Either Blow It Out Or Smother It.*

Usually the flame may be extinguished by blowing sharply and slightly downward through one of the flame-ports at close range. If this does not accomplish results, smother the flame by completely covering the holes in the hood with a gloved hand, a rag, or a small cup or can.

8 *Clean Off The Carbon.*

In normal operation a deposit of carbon will be observed on the hood, wick and wick-holder. This serves a useful purpose in insulating against heat radiation, but to avoid a surplus, the parts, *including the tip of the wick*, should be cleaned before the next period of use. This can best be accomplished by removing the hood, when the carbon can be wiped off with ease. *For best results the air-intakes should be clear.*

In refilling the torch it is a good practice to blow the bits of carbon off the top of the wick-holder before uncovering the torch reservoir, to prevent dropping the carbon into the oil chamber. Also it is good practice now and then, when refilling, to first empty the torch completely of its contents to get rid of water and other residue which may remain from the oil which has been used.

Directions for Adapting the ECONOMY BURNER *To Old Toledo Torches*

The Economy Burner may be adapted to any Toledo Torch we ever made.

1 *Remove Old Burner and Wick.*

2 *Empty Torch Of All Contents.*

3 *Take The Economy Burner Apart.*

4 *Screw The Adapter Into The Torch.*

Place the copper gasket provided, on top of the torch over the filling hole with the flat side up. Insert the screw-collar adapter and seat tightly with a pipe wrench, taking care not to distort its circular shape.

Your old Toledo Torch is now converted to the new type and you may proceed to operate it as described above, for new Toledo Torches equipped with the Economy Burner. The only difference in results will be a slightly shortened burning period for one filling. This is due to an increase in heat transmitted by a slightly larger mass of metal which is present in the adaptation of the Economy Burner to the old torch.

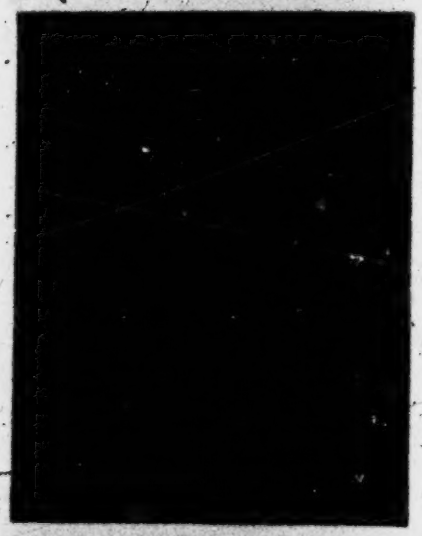
If you have followed these directions carefully you will be surprised with the results obtained. You will experience a *saving of more than fifty per cent* over other torches, in oil consumption. You will not have to replace a wick in less than a year. If you do, we will furnish a new one without charge. If you have any difficulty due to faulty material or workmanship, we will replace the defective torch without charge when returned to us, prepaid. But best of all, you will be protected at all times and through all weather with a safety light that is truly reliable and always understood.

The Toledo Pressed Steel Company, Toledo, Ohio

PLAINTIFF'S EXHIBIT 11-B

Plaintiff's Direction Sheet for Burner in Suit







Toledo Truck Flares

Invite Comparison

Comparison with all other flares on the market — not only over the counter, but after they have both been in service — will show how much stronger and simpler Toledo Truck Flares are constructed — how much better they do their job. No other flare kit so perfectly meets all legal requirements and suits your own convenience. You can carry it by the handle, fasten it to the floor or running board or attach it to the wall in either a horizontal or vertical position. In each case the flares fit the case perfectly, are fully enclosed, and can be securely locked against theft.

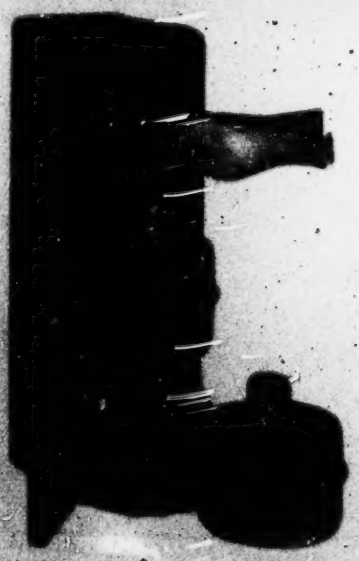
Toledo Truck Flare Kits are supplied in two-flare and three-flare units in a heavy steel, black enamelled case of appropriate size, equipped with a handle and spring steel locking device. Each flare is equipped with the same fully patented Economy Burner that has given our torches eight full years of well-earned popularity — Toledo Flares are simple to operate, easy to clean and always dependable in any kind of weather. Their use is your best insurance against accidents and delay. The illustrations at the left suggest their many conveniences in application.



THREE FLARE
KIT NO. 781



Each Toledo Flare uses the entire volume of the reservoir for fuel—no space sacrificed for trick features. Capacity 2½ pints. Burning time up to 16 hours per filling. The flares are finished in high grade baked red enamel. The burners are cadmium plated. High grade flags with holders to fit the burner, using the flare as a base, complete this compact and convenient outfit—the last word in value.





A knock-out hole in each corner of the bottom of the case is provided for attachment to the truck.

The view at the left shows the application of the combination stuffer-cap-opener, which is used when attaching the kit in a vertical position on the side of the truck body. These are supplied without extra charge where required.

TWO FLARE
KIT NO. 751





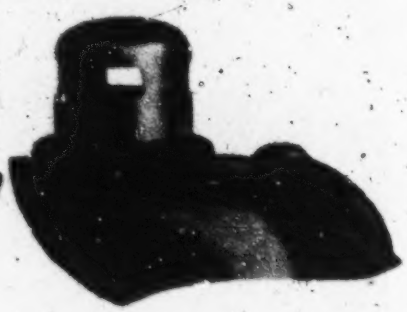
THE TOLEDO PRESSED STEEL CO.

TOLEDO, OHIO

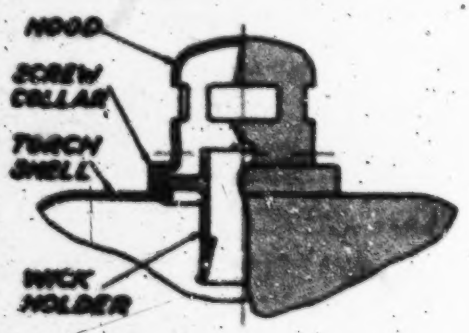
PLAINTIFF'S EXHIBIT 11-C

Plaintiff's Truck Flare Circular

Be sure the torch you buy has this *Economy Burner*



This is a feature on Toledo Torches ...lly covered by patents in United States ...d Canada. Insist on the genuine Economy ...urner, found on the Model F, special one ...llar Toledo Torch.



...xtra Hoods	$0.15 each
...xtra Wick Holders	.15 each
...xtra Wicks	1.50 doz.

Manufactured only by

The Toledo Pressed Steel Co.
TOLEDO, OHIO

And now—

A Special

TOLEDO TORCH

for bus and truck operators

for only

$1.00

F. O. B. TOLEDO, OHIO

PLAINTIFF'S EXHIBIT 15

Circular Showing Letter from Michigan State Highway Commissioner

Page Tightly Bound

Greater Safety

is the object of the recent ruling by the Michigan Public Utilities Commission, which requires all trucks and busses operating in Michigan at night, to carry two oil burning torches, to be placed around the vehicle when it stops on the highway.

To enable operators to meet these requirements inexpensively, we offer this special one dollar torch, known as our Model F.

It's just as fine a piece of work as any of our regular torches and a piece of equipment you will be proud to own.



Price $1.00
F. O. B. Toledo, Ohio

The height has been reduced to make it easy to store away in limited space. If you prefer to carry it hanging, there are two convenient rings for this purpose, or you may provide a board with holes large enough to fit snugly around the bottom section.

This torch is equipped with our patented Economy Burner. You must have this sort

PLAINTIFF'S EXHIBIT NO. 17.

(Filed May 10, 1935)

TEST RUN ON ROOF OF OUR BUILDING FROM 8:25 A. M. TO 5:05 P. M., 4/12/35

Each of four torches was filled and adjusted in the manner recommended for practical use under weather conditions.

1 Using old style burner:
At beginning of period weight.....9 lbs., 11 oz.
At end of period weight.....7 lbs., 10 oz.
Oil consumption .....2 lbs., 1 oz.

2 Truck Flare using Economy Burner:
At beginning of period weight.....4 lbs., 3 oz.
At end of period weight.....3 lbs., 1 oz.
Oil consumption .....1 lb., 2 oz.

3 Bolser Flare:
At beginning of period weight.....3 lbs., 9 oz.
At end of period weight.....2 lbs., 0 oz.
Oil consumption .....1 lb., 9 oz.

4 K-K Flare:
At beginning of period weight.....2 lbs., 5 oz.
At end of period weight.....1 lb., 1 oz.
Oil consumption .....1 lb., 4 oz.

TEST RUN ON ROOF OF OUR BUILDING FROM 8:00 A. M. TO 5:30 P. M., 4/15/35

Each of four torches was filled and adjusted in the manner recommended for practical use under weather conditions.

1 Using old style burner:
At beginning of period weight.....9 lbs., 12 oz.
At end of period weight.....6 lbs., 15 oz.
Oil consumption .....2 lbs., 13 oz.

2 Truck Flare using Economy Burners:
At beginning of period weight.....4 lbs., 2 oz.
At end of period weight.....3 lbs., 0 oz.
Oil consumption .....1 lb., 2 oz.

3 Bolser Flare:
At beginning of period weight.....3 lbs., 9 oz.
At end of period weight.....1 lb., 15 oz.
Oil consumption .....1 lb., 10 oz.

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4# K-K Flare:
At beginning of period weight.....2 lbs., 5 oz.
At end of period weight.....1 lb., 0 oz.
Oil consumption .....1 lb., 5 oz.

TEST RUN ON ROOF OF OUR BUILDING FROM 8:45 A. M. TO 6:00 P. M. 4/16/35

Each of four torches was filled and adjusted in the manner recommended for practical use under weather conditions.

#1 Using old style burner:
At beginning of period weight.....9 lbs., 13 oz.
At end of period weight.....6 lbs., 15 oz.
Oil consumption .....2 lbs., 14 oz.

#2 Truck Flare using Economy Burner:
At beginning of period weight.....4 lbs., 4 oz.
At end of period weight.....3 lbs., 4 oz.
Oil consumption .....1 lb., 0 oz.

#3 Bolser Flare:
At beginning of period weight.....3 lbs., 9 oz.
At end of period weight.....1 lb., 15 oz.
Oil consumption .....1 lb., 10 oz.

#4 K-K Flare:
At beginning of period weight.....2 lbs., 5 oz.
At end of period weight.....1 lb., 1 oz.
Oil consumption .....1 lb., 4 oz.

TEST RUN ON ROOF OF OUR BUILDING FROM 8:30 A. M. TO 5:30 P. M., 4/17/35

Each of four torches was filled and adjusted in the manner recommended for practical use under weather conditions.

#1 Using old style burner:
At beginning of period weight.....9 lbs., 13 oz.
At end of period weight.....6 lbs., 15 oz.
Oil consumption .....2 lbs., 14 oz.

#2 Truck Flare using Economy Burner:
At beginning of period weight.....4 lbs., 4 oz.
At end of period weight.....3 lbs., 2 oz.
Oil consumption .....1 lb., 2 oz.

3 Bolser Flare:
At beginning of period weight.....3 lbs., 8 oz.
At end of period weight.....2 lbs., 2 oz.
Oil consumption .....1 lb., 6 oz.

4 K-K Flare:
At beginning of period weight.....2 lbs., 5 oz.
At end of period weight.....1 lb., 1 oz.
Oil consumption .....1 lb., 4 oz.

TEST RUN ON ROOF OF OUR BUILDING FROM 8:10 A. M. TO 5:30 P. M., 4/18/35

Each of four torches was filled and adjusted in the manner recommended for practical use under weather conditions.

1 Using old style burner:
At beginning of period weight.....9 lbs., 13 oz.
At end of period weight.....6 lbs., 14 oz.
Oil consumption .....2 lbs., 15 oz.

2 Truck Flare using Economy Burner:
At beginning of period weight.....4 lbs., 3 oz.
At end of period weight.....3 lbs., 0 oz.
Oil consumption .....1 lb., 3 oz.

3 Bolser Flare:
At beginning of period weight.....3 lbs., 10 oz.
At end of period weight.....1 lb., 4 oz.
Oil consumption .....1 lb., 12 oz.

4 K-K Flare:
At beginning of period weight.....2 lbs., 5 oz.
At end of period weight.....1 lb., 0 oz.
Oil consumption .....1 lb., 5 oz.

TEST RUN ON ROOF OF OUR BUILDING FROM 8:40 A. M. TO 5:20 P. M., 4/19/35

Each of four torches was filled and adjusted in the manner recommended for practical use under weather conditions.

1 Using old style burner:
At beginning of period weight.....9 lbs., 13 oz.
At end of period weight.....6 lbs., 9 oz.
Oil consumption .....3 lbs., 4 oz.

Plaintiff's Exhibit No. 17.

#2 Truck Flare using Economy Burner:
At beginning of period weight.....4 lbs., 2 oz.
At end of period weight.....2 lbs., 11 oz.
Oil consumption .....1 lb., 7 oz.

#3 Bolser Flare:
At beginning of period weight.....3 lbs., 10 oz.
At end of period weight.....2 lbs., 0 oz.
Oil consumption .....1 lb., 10 oz.

#4 K-K Flare:
At beginning of period weight.....2 lbs., 5 oz.
At end of period weight.....1 lb., 2 oz.
Oil consumption .....1 lb., 3 oz.

TEST RUN ON ROOF OF OUR BUILDING
FROM 8:40 A. M. TO 2:40 P. M., 4/30/35

#1—Old Style Burner

#2—Truck Flare using Economy Burner

#3—Bolser Flare

#4—K-K Flare

No. 2, No. 3 and No. 4 remained burning throughout the period.

#1—was extinguished by the wind at:

9:07 A. M.....Relighted by J. E. Withrow
9:30 A. M.....Relighted by J. E. Withrow
9:59 A. M.....Relighted by J. E. Withrow
10:10 A. M.....Relighted by J. E. Withrow
10:32 A. M.....Relighted by L. W. Close
12:54 P. M.....Relighted by J. E. Withrow
1:06 P. M.....Relighted by J. E. Withrow
1:14 P. M.....Relighted by L. W. Close
2:15 P. M.....Relighted by J. E. Withrow
2:40 P. M.....Relighted by J. E. Withrow

United States weather report records a maximum wind velocity during this period of 24 miles per hour.

No precipitation.

J. E. W.

PLAINTIFF'S EXHIBIT NO. 18

(Filed May 10, 1935)

March 13, 1935.

TEST RUN ON ROOF OF OUR BUILDING
FROM 4:45 P. M., 3-12-35, TO 9:30 A. M., 3-13-35
16¾ HOURS.

1—Using present burner uniform flame throughout period. Same as #2 and #3. Wick extended ¼ in.
Total weight when first lighted.....9 lbs., 8 oz.
At end of period total weight.....7 lbs., 2 oz.
Showing oil consumption of 2 lbs., 6 oz.
No perceptible consumption of wick.

2—Using present burner with slotted hole in top, uniform flame throughout. Wick extended ¼ inch.
Total weight when first lighted.....9 lbs., 7 oz.
At end of period total weight.....6 lbs. 15 oz.
Showing oil consumption of 2 lbs., 8 oz.
No perceptible consumption of wick.

3—Using present burner with top cut out, uniform flame throughout. Wick extended ¼ inch.
Total weight when first lighted.....9 lbs., 13 oz.
At end of period total weight.....7 lbs., 1 oz.
Showing oil consumption 2 lbs., 12 oz.
No perceptible consumption of wick.

4—Using old style standard torch, larger flame than No. 1, No. 2 or No. 3 at first. After one hour very slightly larger and at end of period very much smaller. Wick extended 1½ inches.
Total weight when first lighted.....9 lbs., 8 oz.
At end of period total weight.....6 lbs., 5 oz.
Showing oil consumption of 3 lbs., 3 oz.
Wick ⅞ inch long, showing consumption of ⅝ inch.

J. E. Withrow
Lyman W. Close

TEST RUN ON ROOF OF OUR BUILDING
FROM 1:00 P. M., 3-14-35, TO 4:15 P. M., 3-15-35
27¼ HOURS.

1—Using present burner, uniform flame throughout period. Wick extended ¼ inch.
Total weight when first lighted.....9 lbs., 10 oz.
At end of period total weight.....5 lbs., 11 oz.
Showing oil consumption of 3 lbs., 15 oz.
No perceptible consumption of wick.

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#2—Using present burner with slotted hole in top 7/32" x 1⅛", uniform flame throughout. Wick extended ¼ inch.
Total weight when first lighted.....9 lbs., 13 oz.
At end of period total weight.....6 lbs., 1 oz.
Showing oil consumption of 3 lbs., 12 oz. No perceptible consumption of wick. At 7:30 A. M., when first examined, slotted hole was completely closed by carbon, the same as on previous tests run 3-13-35.

#3—Using present burner with top cut out, uniform flame throughout. Wick extended ¼ inch.
Total weight when first lighted.....9 lbs., 9 oz.
At end of period total weight.....5 lbs., 8 oz.
Showing oil consumption of 4 lbs., 1 oz.
No perceptible consumption of wick.

#4—Using old style standard torch, flame same as others at beginning of period but smaller at end. Wick extended ¼ inch.
Total weight when first lighted.....9 lbs., 12 oz.
At end of period total weight.....4 lbs., 5 oz.
Showing oil consumption of 4 lbs., 5 oz., and ⅛ inch wick consumed. In this test, however, the ¼ inch extension of wick would not be used in the practical functioning of this torch, as the flame would not withstand even a moderately strong wind. For test purposes the torch was placed in a sheltered position.

J. E. Withrow
Lyman W. Close

TEST RUN ON ROOF OF OUR BUILDING FROM 9:00 A. M., 3-15-35 TO 12:15 P. M., 3-16-35 27¼ HOURS.

Each of four torches was filled with exactly five pints of kerosene and allowed to burn until all oil was consumed. All flame were started at about equal size.

#1—Using present burner, uniform flame except for last two hours, when it started to diminish. Ran to 12:15 P. M., 3-16-35 — 27 hrs., 15 min.

#2—Using present burner with slotted hole 7/32"x1⅛". Uniform flame except for last two hours, when it started to diminish. When observed at 3:00 P. M.

3-15-35, slotted hole had practically closed with carbon and for all purposes was completely closed from then on. Ran to 11:20 A. M., 3-16-35—26 hrs., 20 min.

3—Using present burner with top cut out. Uniform flame except for last two hours, when it started to diminish. Ran to 8:25 A. M., 3-16-35 — 23 hrs., 25 min.

4—Using old style torch. Flame gradually decreased from beginning and at no time as large as previous experience showed necessary for trustworthy performance in weather hazards. Ran to 8:10 A. M., 3-16-35—23 hrs., 10 min.

J. E. Withrow
Lyman W. Close

TEST MADE ON OUR ROOF

1:00 P. M., 3-20-35, TO 6:00 P. M., 3-21-35

AND

7:45 A. M., TO 6:00 P. M., 3-22-35, AND
7:45 TO 9:30 A. M., 3-23-35

All torches filled with exactly 5 pints of coal oil. Started to rain 3:00 P. M., 3-20-35, and during the night severe rain and wind.

1—Standard Economy Burner ran through all periods. Was purposely extinguished at 6:00 P. M., 3-21-35, and reset at 7:45 A. M., 3-22-35. Extinguished purposely at 6:00 P. M., 3-22, and reset at 7:45 A. M., 3-23. Oil consumed and flame went out at 9:30 A. M., 3-23-35—41 hours.

2—Economy Burner with slotted hole 7/32" x 1⅛". Was out from attack of weather at 7:45 A. M., 3-21-35. Not knowing what time of night it was extinguished, further test was discontinued.

3—Economy Burner with top cut out. Extinguished by weather at 3:30 P. M., 3-20-35. Relighted and was out at 7:45 A. M., 3-21-35. Not knowing what time of night it was extinguished, further test was discontinued.

4—Old style standard torch. Same as #2.

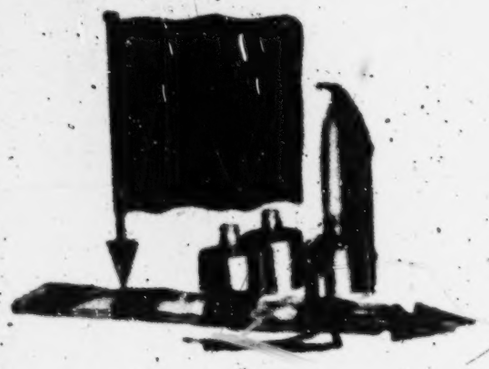
J. E. Withrow
Lyman W. Close

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GENUINE BOLSER FLARES

Genuine BOLSER Flares

The NEW IMPROVED FLARE for Trucks and Cars



FLAGS KITS

3 FLAGS AND HEAVY CANVASS BAG $2.00

The most complete line of flares and safety equipment. Genuine Bolser Flares are made to fit every size truck. Bolser locked-in-place flares are easily carried in any truck as regular equipment. Truck and Bus owners and drivers want ALL of the features combined only in Bolser Flares. They want CONVENIENCE, SAFETY, STEADY BURNING, MORE HOURS OF OPERATION. They know they must do their part in preventing accidents. Flares are the cheapest and best way of avoiding dangerous and costly accidents. The demand for dependable, long lasting flares is growing. State laws are enforcing this equipment.

Bolser Flares are your safety insurance. They are always ready for use—quickly set out or picked up — and more efficient than the law requires.

Genuine Bolser Flare Units to fit every need, such as our 3-unit Flare and Flags for trucks and busses; 2-flare units for autos and trucks; extra single units, etc.

$1.50
PER SINGLE UNITS

CAP & HANDLE
75c EXTRA

CARRIERS
75c EXTRA

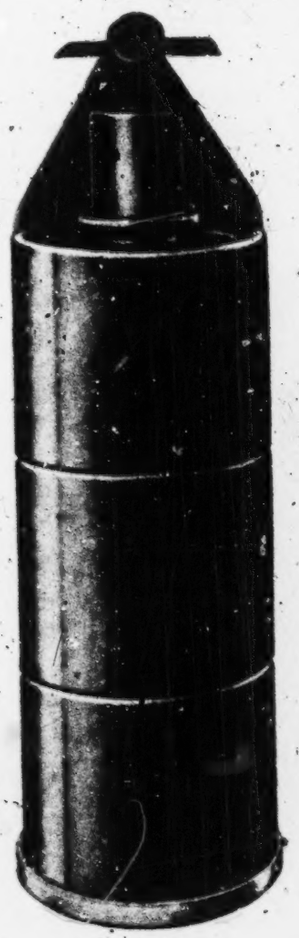


$3.95



2 FLARES
CAPHANDLE AND CARRIER

$4.95



3 FLARES
CAPHANDLE AND CARRIER

For Safety--Always Use BOLSER FLARES

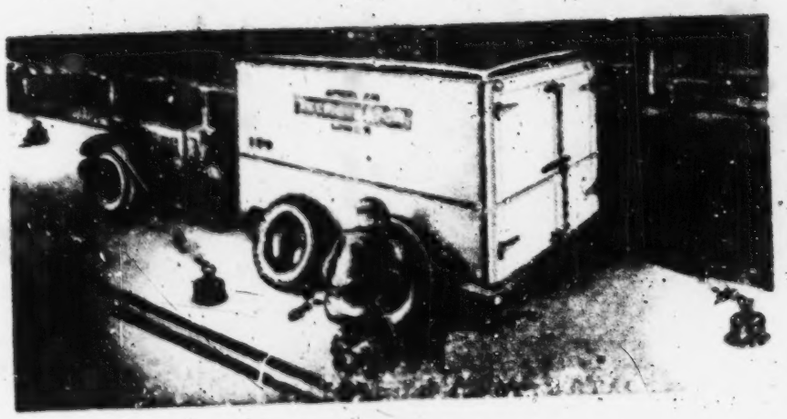
SPECIFICATIONS

SHAPE: Round—flat top.
CAPACITY: Approximately 2 pints per flare.
FUEL: Kerosene.
BURNING TIME: Approximately 12 hours.
HEIGHT: 4-inch flare; 15½ inches overall.
DIAMETER: 5 inches.
BURNER TIP: All weather shield and generator.
WICK: Round, ⅜-inch.
FINISH: Lacquer—green flare and orange holder.
HOLDER BRACKET: Pressed steel with spring locking device drilled for bolts.

SAFETY FOR OTHERS

SAFETY FOR YOURSELF

SAFETY FOR OTHERS



THEY NEST TOGETHER

BOLSER CORPORATION

DES MOINES, IOWA
S.W. NINTH & MURPHY ST.

PLAINTIFF'S EXHIBIT 19-A

(Filed May 10, 1935)

Bolser Circular

Genuine BOLSER Flares

THE ONE DEPENDABLE FLARE

WITH OUTSTANDING FEATURES

6

No other flare of any kind provides ALL of the features of construction and advantages in operation that are combined in Bolser Flares. Every truck needs Bolser Flares to prevent accidents and to be within the law. Bolser Flares assure LONG LIFE—EASY OPERATION—INCREASED DEPENDABILITY.

A. The New "Valve Seat" Seal, patterned after the efficient automobile valve assures a perfect, long wearing, compensating seal at the bottom of the burner cap. When Genuine Bolser Flares are properly and tightly nested, this new seal absolutely prevents seepage or leakage of fuel and eliminates dangerous fumes. It's safe and sure. This is an exclusive Bolser feature.

B. The New Bolser Flares now incorporate four Breather Channels inside the wick tube, instead of the usual hold or holes drilled through the filler cap. These breather tubes equalizes the air pressure, allow free circulation through the entire wick, eliminate "fuel starvation" in high winds and increase the wick saturation without allowing the fuel to spill out, even when inverted. These breather channels are typical of Bolser engineering—building flares to give the best possible service.

C. The New Burner Tip on Genuine Bolser Flares greatly facilitates servicing or cleaning and adjusting the wick. Makes servicing the flare or wick simple and easy. This new tip also gives increased resistance to wind velocity.

D. The New Deflector Cup adds greatly to economy and efficency of Genuine Bolser Flares. It is cup-shaped to deflect the direct air current away from the wick. When heated, acts as a generator and burns around the rim of the cup and not off the wick. This arrangement saves the wick and saves fuel, increases burning hour capacity of the flare. Gives a full inch of burning surface from a ⅝-inch wick.

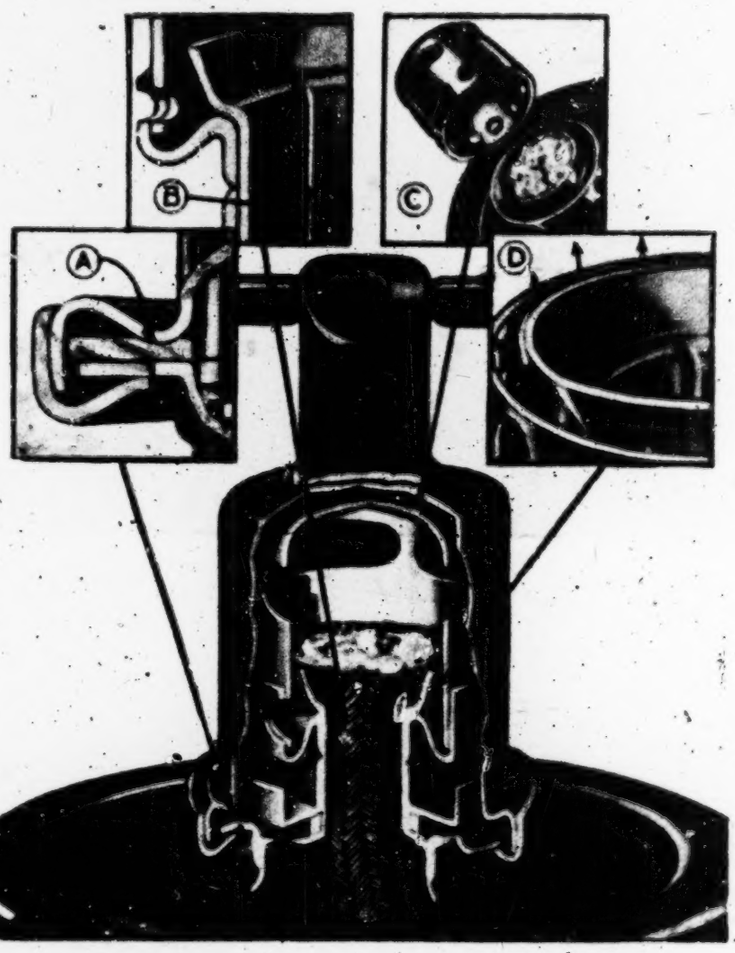
E. The fifth advantage of Bolser Flares is shown on the left below. The entire set of three flares is carried in one handy safe unit. Bolser Flares nest and can be locked in holder bracket. The unit can be carried on the inside or outside of the truck. The Bolser unit is rattle-proof and wear-proof.

F. The sixth big feature of Bolser Flares is the unique handle and locking device. Flares are easy to set out and pick up. A quarter turn of the handle locks the nested flares into a compact unit.

BOLSER CORPORATION

DES MOINES IOWA, U. S. A.

FROM **$3.95** TO **$4.95**





ALWAYS READY



EASY TO SET OUT AND PICK UP

THE ONLY **NESTED** FLARES

PLAINTIFF'S EXHIBIT 19-A

(Filed May 10, 1935)

Bolser Circular

PLAINTIFF'S EXHIBIT NO. 19-B

(Filed May 10, 1935)

THE BOLSER CORPORATION

Manufacturers of Genuine Bolser Products

S. W. 9th and Murphy Streets

Des Moines, Iowa

April Fourteenth, 1934.

lemen:

You will find enclosed a copy of your new Illinois issued under General Order Number 133 by the e of Illinois Commerce Commission.

Illinois has just recently passed this flare law and you, a jobber, there are hundreds of dollars of profit is flare business if you will Step Out And Get It!

We are the pioneers of auto and truck flares. In the erent states of the Union in which we have operated have passed flare laws, we have supplied the jobbers thousands of flares.

From our experience, we suggest that you immeely contact your salesmen and supply them with a ple flare and have them start contacting auto acces- dealers and garages, filling stations, truck depots supply houses, and reap this harvest.

We are enclosing a photostatic copy of a letter to trate to you just what one little jobber in northwest did when the Iowa Flare Law was passed. For r information, he has passed the six thousandth flare his time.

Enclosed is a circular which describes our flare line. ask that you read this over carefully before placing r order for flares.

Off the prices listed on this circular, we will allow bers a discount of 50—5%, and 5% for cash, freight wed in lots of a dozen or more.

Now is the time to stock Genuine BOLSER Flares the flare which has become most popular with truck fleet owners.

Very truly yours,

The Bolser Corporation

B:RL

R. W. Smith.

3

Plaintiff's Exhibit No. 19-C

PLAINTIFF'S EXHIBIT NO. 19-C

(Filed May 10, 1935)

NORTHWEST IOWA HEATER COMPANY

Phones 40 and 866

Le Mars, Iowa

September 23, 1933.

Mr. C. M. Bolser
President, Bolser Corporation
Des Moines, Iowa

Dear Clark:

We are this morning sending you an order for five hundred (500) Flares, to be shipped immediately, which will make our thirty-five hundredth Flare.

At this time we wish to take the opportunity to thank you for your many kidnesses to our organization as we feel that thirty-five hundred Flares must put us pretty well up in the list of producers. If you remember at the time that I secured my first flare on the one thousand flare order given you on or about June 19, 1933, I told you that we would sell between 2,500 and 5,000 Flares. We have just 1,500 more to go to reach the maximum and you should receive orders for these inside of the next two or three weeks.

It is our experience that the Bolser Flare has been a life saver for us. We have made more money from it in the short two and one-half to three months that we have been handling it, than anything else we have handled. It has given us additional volume at the time we needed it worst, and is, without question, the fastest moving piece of merchandise that has ever been my privilege to see, probably due chiefly to the sales promotion efforts of your company.

Without stopping to check invoices, we have added at least two hundred new dealers to our list of customers. Naturally, we will get repeat business on our other merchandise, as well, from them.

We again wish to thank you for your many kindnesses and trust that our business relations may continue to be pleasant and profitable.

Very truly yours,

Northwest Iowa Heater Company

H. R. Harley

HRH:MB

Jobbers of Winter Automotive Necessities

Page Tightly Bound

K-K TRUCK FLARES AND FLAGS

Now laws in many states compels trucks to carry this equipment!

No.2-B Stock No.A-3022
No.3-B Stock No.A-3023C

Even in states which have no flare laws many liability insurance companies compel trucks to carry flares and flags. K-K TRUCK FLARES are especially designed for this purpose.

(Filed May 10, 1938) Kari-Keen Circular
PLANTSIDE SECURITY
No. 110

FEATURING THE NEW IMPROVED . . .

LEAK WIND RAIN PROOF BURNER CAP





One flare must be placed 50 to 75 feet in front of stopped truck on highway at night, the other 50 to 75 feet behind; in some states a third at the side.

These flares burn kerosene or fuel oil. They are carried in a convenient steel carrying case that is attached to the truck body or cab where they are always clean, dry, and ready for use. They can be protected against theft by use of a small padlock. They are furnished with either two or three flares to the kit and the three flare kit is equipped with two or three red flags if wanted. These flares are made of heavy 20 gauge steel and will last for years. They burn cooler than other flares and can be carried in the hand any place after being lighted or after burning several hours.

The specially constructed burner will continue to burn in a forty-mile gale and is not affected by rain or storm. The heat generated in this burner converts the fuel to a gas and only the gas burns. This adds a long life to the wick.

K-K TRUCK FLARES come packed six to the carton in either size kit.

Your Choice of Three Different Kits for Trucks



List Price

No. 2-B—Two flares and steel carrying case. Burning time, 4 to 5 hours when full

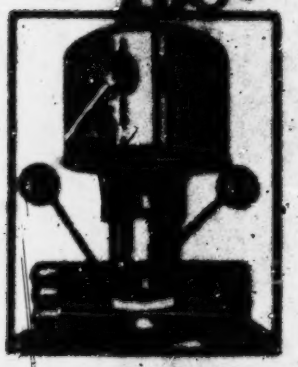
No. 3-B—Three flares and steel carrying case. Burning time, 6 to 7½ hours when full

No. 3-B-F—Three flares and steel carrying case, including compartment equipped with three red flags with collapsible staffs

Extra flags made especially to be carried in No. 3 case, size 9½x12 inches with 30 inch flag staffs when extended. Good quality cloth with fast color. Each .20



Sell { KK-L/DZ single sets
{ DAZ cartons of 6 sets or multiples



Brief Synopsis of State Flare Laws

IOWA—The state law requires the use of two flares. The State Highway Department recommends three flares be carried and used. The laws read, vehicle carrying a load [illegible] is operated on the highway after night or and must be equipped with flares. The Iowa Highway Department of Iowa states this law will be rigidly enforced.

MINNESOTA—The state law requires all trucks to carry "red flares" and red flags. A ruling made by the Minnesota Railroad and Warehouse Commission requires all permit operators and contract carriers of [illegible] trucks equipped with three burning flares and three red flags. The Minnesota Highway and Safety Department have recommended that all trucks equipped with three burning flares would comply with this law. After making various tests on the highways at night with all types of flares and flares signal devices it was their opinion that three burning flares provided more safety than any other type safety to flare "burning" light and the long time they will burn.

NEBRASKA—The law requires every motor vehicle to be equipped with two flares and two red flags.

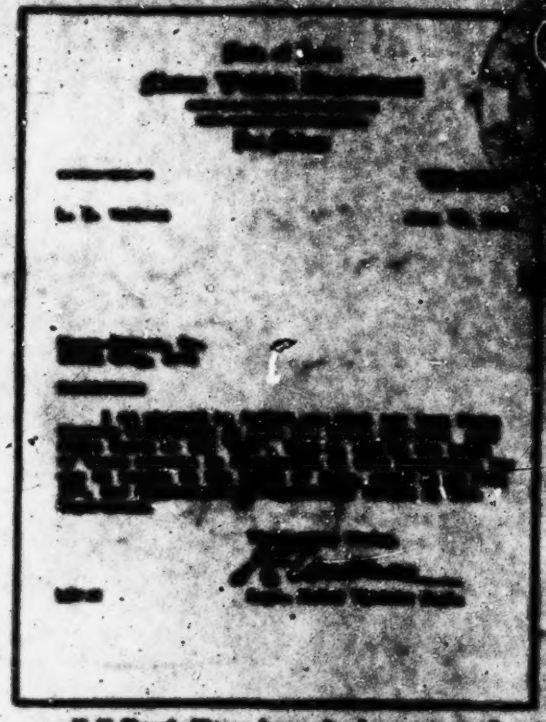
MICHIGAN—All motor vehicles operating on the highway the law are required to carry three flares or according to the safety code by the Michigan Public Utilities Commission.

KANSAS—This state requires the carrying and use of two flares.

MISSOURI—This state also requires the use of two flares.

CONSENSUS

All states require that any truck flare, outside the state operating on the highway must comply with the laws and regulations of that state. The owner and thousands of trucks in states [illegible] states that have their laws must also apply their trucks with flares and flags. The difference in laws of the various states is at present [illegible] but it is the consensus of public opinion that all states will soon adopt uniform laws and regulations of handling [illegible] on the highways to [illegible] flares and flags.



S-E Truck Flares have also been approved for use in [illegible] and are now approved in other [illegible] have been or ready to [illegible]

SMALL FLARES for AUTOMOBILES

No. 3-A-S—Two flares and steel carrying case, 1½x1½x8 inches. Burning time approximately four hours. $3.25

No. 3-A-S—Three flares and steel carrying case, 1½x1½x10½ in. Burning time approximately four hours. $3.85

Owned and Operated by

Myers-Wilson Mfg. Co.

Former Officials of the Eastern Manufacturing Co.

1210 FIFTH STREET SIOUX CITY, IOWA



Fire Chief
Fire Apparatus
Fire Equipment
Fire Fighting Chemicals
Fire Hose
Fire Protection
Fire Prevention
Fire Service
Fire Training
Fire Trucks
Fire Water
Fire Wood
Fire Work
Fire Worker
Fire Worship
Fire Worshipper
Fire Worshipping
Fire Worshipping Temple
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199 PLAINTIFF'S EXHIBIT 22

(Filed May 10, 1935)

Dietz First Open Flame Burner Circular

DIETZ ROADSIDE TORCHES for Contractors

No. 96 SPHERICAL TORCH

No. 89 HEMISPHERICAL TORCH

DIETZ ROADSIDE TORCHES fulfill the most exacting requirements for this type of lighting device. They are solidly built of steel to withstand rough usage. In design and construction there is evidenced the same careful regard for dependability and efficiency previously this characterizes all Dietz products.

The Spherical Torch has a [illegible] which connects it to return to position if tipped or knocked over. The Hemispherical Torch is not weighted but is has a broad, stable base with [illegible] is a fixed cushion.

SPECIFICATIONS

Dietz Roadside Torches burn Kerosene, [illegible] Oil or Distillate. They are made in two styles as illustrated. Each is provided with a [illegible] burner [illegible] and a [illegible] mantle lock, which prevents the wick from [illegible]

No. 96 Spherical Torch equipped [illegible]

No. 89 Hemispherical Torch equipped [illegible]

DIETZ ROADSIDE TORCHES are unexcelled by any device of their type for lighting power and dependability in all kinds of weather.

These torches are made in two distinct models, adaptable to all service conditions and providing an attractive price range to meet the varying requirements of contractors.

R. E. DIETZ COMPANY
NEW YORK
Largest Makers of Lanterns in the World
FOUNDED 1840





DIETZ HIGHWAY FLARE TORCH *for Motor Vehicles*

(LENSES NOT VISIBLE)

Designed to comply with the Law in States requiring that two Road Torches be carried by Motor Trucks and Buses for use in event of breakdown on the road.



No. 55

As Used in Close Work
(SHIELD SHOWN)

...ator which laws of certain states re... that two torches of this type be car... on Motor Trucks and Buses. In the ...ding on the right-of-way, a lighted ...ed on the road both ahead and behind the vehicle for protection of other traffic.

No. 55 Vehicle Torch is of similar construction and functions exactly like our larger torches but is made of lesser height, so that a pair can readily be carried under the driver's seat

SPECIFICATIONS

SHAPE: Rectangular, Rectangular
CAPACITY: 16 Fluid Ounces (1/2 Qt.)
FUEL: Kerosene or Light Fuel Oil
BURNS: More than 10 Hours
HEIGHT: 15 Inches
MARKED: 15 Inches
SHIELD: ALL-WEATHER with Rain Shield
WICK: Round, ½ Inch
FINISH: Burnished Red
PACKED: 2 in a Carton
SHIPPING WEIGHT: 5 Lbs.



Made of Size to Fit Under Driver's Seat of Motor Vehicles When Not in Use

PLAINTIFF'S EXHIBIT 23

Dietz Circular Showing Hooded Burner

THE Dietz Factories have specialized in oil-lighting devices for ninety years. The highly organized manufacturing facilities and technical experience which have brought Dietz Lanterns to world leadership and popularity afford abundant assurance that Torches made by Dietz will be GOOD Torches.

Three numbers of Dietz Torches are now in production, providing an attractive price range and selection to meet all present-day requirements in the most approved manner.

Dietz Torches offer you lighting power and visibility unexcelled in this type of lighting device.

R. E. DIETZ COMPANY
NEW YORK

Largest Makers of Lanterns in the World
FOUNDED 1840



TOPPING BROTHERS
189 Varick Street
New York, N. Y.

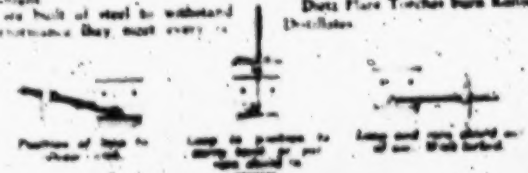
DIETZ HIGHWAY FLARE TORCHES

DIETZ Highway Torches are favored by motor car Contractors who prefer this type of night warning device for use while road construction is in progress.

The torches are made in two styles, one spherical and the other hemispherical in shape. Of the latter there are two sizes, the smaller being particularly designed for use on the narrow Skid Locks which require their use by Motor Trucks and Buses that become stalled on the highways at night.

Dietz Flare Torches are built of steel to withstand rough usage. In performance they meet every requirement of which torches are capable. A notable structural feature is the ALL WEATHER BURNER of steel, which is fitted with Carrying Handle, Automatic Wick Lock and Adjustable Rain Shield. The flame burns perfectly with or without the shield. The shield is not intended to aid burning and torches are designed to function without it. Hence the shield is kept turned down, away from the flame, unless protection is desirable against rainy or snowy weather.

Dietz Flare Torches burn Kerosene, Fuel Oil or Light Distillates.





No. 96

(WEIGHTED)

DIETZ No. 96 Torch is made of steel. Because of its spherical shape and weighted bottom this torch will right itself when tipped down or shielded from position by a post or bracket. It is fitted with the Dietz ALL-WEATHER Steel Burner with Rain Shield, Carrying Loop and an Automatic Wick Lock, which locks the wick from slipping.

SPECIFICATIONS

- Spherical, with weighted bottom
- CAPACITY: 30 Pint Capacity
- Kerosene or Light Oil
- Burns more than 30 Hours
- HEIGHT: 17½ Inches
- DIAMETER: 7½ Inches
- BURNER: ALL-WEATHER with Rain Shield
- WICK: Round, ¾ Inch
- FINISH: Brushed Black
- PACKED: 1 in a Carton
- SHIPPING WEIGHT: 11 Lbs.

Illustration at right shows Dietz No. 96 Torch, burning with Rain Shield in the "down" position.



The ALL-WEATHER BURNER *How It Works*

DIETZ ALL-WEATHER Torch Burner is of the well known Dietz design and construction, and is fitted with the Dietz Automatic Wick Lock. The wick of this burner is round, thus the full circumference of the wick is exposed to the air, which is drawn in through the openings in the base of the burner. This air supply, mixing with the vapor from the burning oil, produces a clear, smokeless flame. The wick lock is a device which prevents the wick from slipping down in the burner tube when the torch is tipped over. The wick lock is operated by the thumb screw on the outside of the burner. When the wick is raised to the proper height for burning, the wick lock is set by turning the thumb screw to the right. This causes the wick lock to grip the wick and hold it in position. To lower the wick for trimming, turn the thumb screw to the left. This releases the wick lock and allows the wick to be lowered. The wick lock is also a safety device which prevents the wick from being drawn down into the burner tube when the torch is tipped over.

DUE TO ITS OPEN CONSTRUCTION, DIETZ ALL-WEATHER BURNER WILL NOT BECOME CLOGGED WITH SOOT





No. 80

(NOT WEIGHTED)

DIETZ No. 80 Hemispherical Torch is made of steel. With its capacity of [illegible] Pint Burner, the burner providing ample [illegible] and the carrying handle adds [illegible] against injury. On the torch is an ALL-WEATHER Steel Burner, with Rain Shield, a Carrying Loop, An Automatic Wick Lock [illegible] wick from slipping.

SPECIFICATIONS

- [illegible]
- [illegible]
- [illegible]

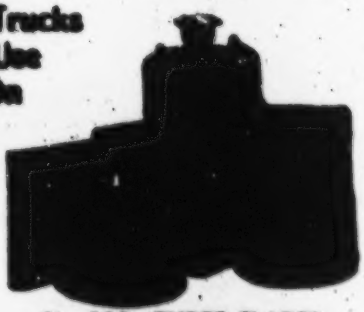
The DIETZ MOTOR TRUCK Flare Kits

Carried By Motor Trucks
For Emergency Use
When Stalled On
The Road
At Night

• Made Better
• Burn Better



No. 333—TWO FLARES



No. 332—THREE FLARES

Why Dietz Flares?

Dietz No. 33 Waterproof Truck Flare

Dietz No. 33 Waterproof Burner

Before using Dietz Flares, see that



Dietz No. 33 Waterproof Truck Flare



DIETZ No. 33 STORMPROOF TRUCK FLARE

Dietz No. 333 Carrier For No. 33 Truck Flares

Dietz No. 333 Carrier for No. 33 Truck Flares is a convenient and

No.	24 Cans	Number in Ctn.

PACKING: ALL DIETZ ARE PACKED ONE TO A CARTON. POWDER AND BRASS.

DIETZ

department stores, stores, public utilities, road builders and progressive contractors everywhere. Stay lit in any kind of weather—rain, wind, snow, sleet.

RELIABLE! SAFE!

No. 1 Large
11 Cups
4 quart.
burns 48 hours.

No. 2 Small
11 Cups
2 quart
burns 24 hours.



CASE No. 1408-14 L.

PLAINTIFF'S EXHIBIT

No. 25

McCLOSKEY Torches are made in two halves, of rolled and pickled deep drawn steel and welded together. Reflectors are heavy nickel pressed in the bottom absolutely prevents them from being knocked over.

McCLOSKEY Torches will burn from Saturday night until Monday morning, with just one filling. No burnishing is necessary. One dozen matches will light up your job better than 50 lanterns, which makes the first cost about the same; but with matches your first cost is the last, and lanterns need replacing continually. If you will figure up your time cleaning globes and the cost of replacing globes and lanterns, you will be amazed and wholly understand why 175 factories are employed to supply this demand. Large cities who have looked into the matter have adopted matches as standard equipment, and most of the Mines and Utility Companies are doing the same.

[illegible] appeal particularly to [illegible] on a small margin of profit, as they supply illuminous protection at minimum cost.

No. 2 Torch, packed in cartons of 4, weighing 30 lbs.

No. 1 Torch, packed in kits, 100 pounds to the dozen.

Barrel Cleaning Brush, [illegible] Diameter.

[redacted]

[illegible] TORCHES

POSITIVELY

The Best Danger Signal Model



Powered [illegible]

LEAD [illegible]

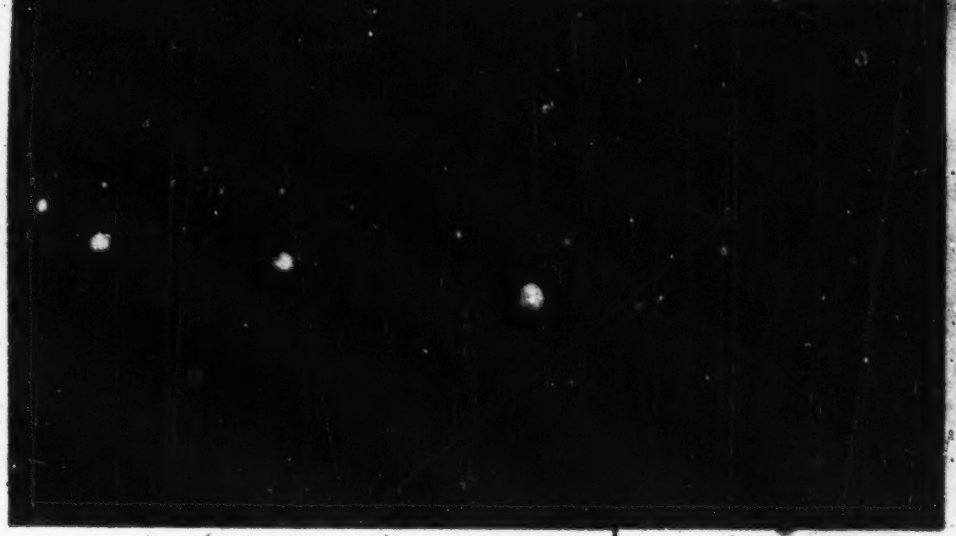
[illegible]

DEPENDABLE

ECONOMICAL

[illegible]

McC[illegible]





WHY PROTECT YOUR JOB WITH A PIECE OF TIN

When you can get a real danger signal, affording protection under all conditions at less cost. We have explained to you elsewhere why torches are more economical, but our main appeal to you is the feature of safety. The cost of defending a damage suit if you win it is enough to supply you with torches for a life time, and if you lose it the cost may be enough to put you out of business. When you put 50 torches on a job at night you know there will be 50 there in the morning, as they are unburnable and never stolen, being suitable for construction work only, but when you put 50 lanterns on the job, you are likely to have 25 stolen and the other 25 broken up by joy riders. McCloskey torches will pay for themselves in a short time and you will always have the feeling that your job is protected and traffic will move rapidly and safely through the danger zone.

Torches are being used in Australia, Central America and South America and all parts of the United States and Canada.

If your dealer does not handle torches write us, and we will give you the name of the nearest dealer, or supply you direct as you cannot afford to be without this modern protection.

205

McCloskey BOMB SHELL Torches



Torches are made to burn and all kinds of weather. They are insurance against accidents. in prices and information.

CASE NO. 7,253
PLAINTIFF'S EXHIBIT
No. 26

YOU CAN'T UPSET THEM

THEY RIGHT THEMSELVES

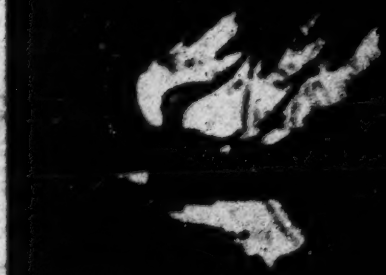
McCLOSKEY TORCH CO.

TOLEDO, OHIO

Street
Illust. 9/29

207

TOLEDO TORCH



The harder
the better th

Toledo Torches have estab
a reputation . . . for depen
performance at low cost, th
unequalled by any other
light made.
Sold by equipment dealers every

The
Toledo Pressed Steel Co
Toledo · Ohio

PLAINTIFF'S EXHIBIT NO. 27

(Filed May 10, 1935)

IOWA

STATE HIGHWAY COMMISSION

AMES, IOWA

missioners:
d C. Riepe, Chairman, Burlington
mas A. Way, Des Moines
A. Maine, Waterloo
J. Ditto, Sibley
D. Archie, Sidney

F. R. White,
Chief Engineer

April 9, 1935.

Toledo Pressed Steel Co.,
Phillips Avenue,
do, Ohio.

Attention Mr. Lyman W. Close

lemen:

In response to your recent request for information rding our truck flare laws, their administration and methods of tests for the flares used under the re- ements of these laws, rules, regulations and the spe- tions developed for the flares, we have prepared the wing statement:

Certain of the laws enacted by the Forty-fifth Gen- Assembly of Iowa Legislature, early in the spring 933, required that after May 4, 1933, motor trucks motor truck combinations, during the period from alf hour after sunset to one-half hour before sun- should be equipped at all times with portable flares. flares were to be used in indicating the location of ehicle when stopped on or adjacent to the travelled ay during the hours of darkness.

The laws as stated in Chapter 83 of the Acts of the fifth General Assembly failed to specify the en- agency, but it has been held that the Motor Ve- Department was implied as this agency. Under this it was further implied that the Motor Vehicle ment had authority to prepare rules and regula- for the enforcement of, and compliance with these The rules and regulations issued by the Motor le Department have been published in a pamphlet otor Vehicle Laws prepared and circulated by that

department. Two copies of this pamphlet have been c closed. The flare laws are found on pages 21 and 22, a the rules and regulations arising from them on page

In these rules and regulaitons the Iowa State Hig way Commission became involved in the administrati of the laws through a co-operative agreement with t Motor Vehicle Department to the extent whereby t Highway Commission would test the flares and ma recommendations regarding their disposition and use.

The first action of the Highway Commission w that of a survey of the types of flares which would available for this use, and the second consideration w that of a specification and method of test for the sele tion of the flares which would be satisfactory. As a r sult, after a considerable amount of experimental wor specifications for flares were developed by the Highw Commission and approved by the Motor Vehicle Depar ment. These studies were made upon all the readi available types of flares and signal lamps which cou be considered practical for the use to which they we to be put.

In the experimental work it first became necessar to select the characteristics of the flares to be observe and measured and, second, to devise methods of tests fo the accomplishment of these objectives. Four tests we devised, namely the wind test, the combined wind an rain test, the carbon deposition test, and the length burning time test.

For the wind tests a wind tunnel was prepared i which definite velocities of wind could be provided, an these velocities repeated as often as desired. After somewhat lengthy consideration of actual operating co ditions as they would exist for these flares when used i Iowa, two velocities were selected for these tests, one 40 miles per hour, and the other of 26 miles per hour.

In the combined rain and wind test, the wind velo ity was 26 miles per hour, and the rain applied at th rate of 2.48 inches per hour. In the carbon deposition test, the amount of carbon and its effect on the behavio of the flare was noted after two hours of operation in quiet atmosphere. The length of burning time was de termined by actual tests of the flares or lamps unde actual operating conditions.

Page Tightly Bound

The specifications for the flares which were adjudg- to be satisfactory required, for the wind tests, that flare remain lighted at least 30 second in the wind miles per hour, and that it should burn continuous- in the wind at 26 miles per hour; that the flare burn at least five minutes in the combined rain and wind ; for the carbon deposition test, that the carbon de- be light and the flare burn, or remain in such con- that it would pass the two proceeding tests; for burning time tests, that the flare or lamp remain ted for at least eight hours.

In the experimental work preceding the develop- of these tests and the preparation of the specifica- , it was found that a considerable number of flares d be made available for use as satisfactory signals r the requirements of the truck flare law. The ipal group of these flares were of the oil burning, equipped class. These were of two general types, open or unprotected flame type and the hooded, or ected, flame type. None of the open flame type gave factory performances in the tests described above, icularly the wind and the combined wind and rain .

The hooded or protected flame type proved to be a t improvement over the open flame type. There offered, however, samples of the hooded type which d to meet the requirements of the above specifica- principally for the reason that the combustion ber within the hood protecting the flame was either iciently ventilated, or was too small to permit sat- tory combustion of the oil and gases drawn from wick.

As a result none of the open flame type were con- red satisfactory for use in this work, and the results these tests were checked by observations of the per- ance of the open flame type, which have been used some form or another as flares indicating obstruc- , work under construction, or barricades on con- ction projects.

All of the hooded or protected flame type were d to be a great improvement over the open flame as produced by the same manufacturer. In several ances manufacturers originally producing open

Page Tightly Bound

Plaintiff's Exhibit No. 31.

PLAINTIFF'S EXHIBIT 31
No. 181,030.
Catalog Sheet Illustrating Device of Billingham Patent.

CATALOG PAGE ILLUSTRATING BILLINGHAM TORCH

BILLINGHAM'S IMPROVED STREET LAMP TORCH

(Patented)



Fig. 1394

A. Shows Flame.

B. Shows Burner.

C. Reservoir for holding oil.

D. Bottom into which the handle is fitted.

E. The torch complete, less the handle.

Fig. 1. Represents a view of the Torch with *outline* of Shell or outside covering.

Fig. 2. Shows aperture through which it is designed to light the Torch without removing the cover or outside shell.

DIRECTIONS:

For filling, unscrew and remove outside shell or cover, also unscrew burner and fill as in ordinary lamp.

For lighting the Torch, push aside the covering to aperture, Fig. 2, by means of thumb piece, as shown, and light with a match, after which close aperture and the Torch is ready for use.

Use Sperm Oil.

Length, 11 inches. Each, $6.00

The necessity for some device for Lighting Street Lamps without the aid of a ladder has long been felt. The accompanying cut illustrates an article that entirely does away with the old slow mode of climbing up and lighting with a match.

By fitting this torch to a handle—any length that is desired—it can be carried in any weather, without danger of blowing out. Passing it up through the bottom of the lamp and pressing against one arm of the Street Lamp Cock, the gas is let on and lighted at the same instant. The gas can also be extinguished by pressing against the other arm of Street Lamp Cock. We are now prepared to fill orders at short notice for both articles, and commend them to Gas Companies and all others interested in Street Lamp Lighting.

flame types of flares improved them by enclosing, hood ing, or in some manner protecting the flame. In som cases, however, manufacturers not previously producin flares presented samples of hooded types of flares whic were unsatisfactory. In the majority of cases the flare were made satisfactory by re-designing or improvin the construction of the hood, cap, or other protection fo the flame.

We believe this will give you, briefly, the history o the development of flares, flare tests, and flare specifica tions, as they have been accomplished in Iowa.

We regret that we were unable to comply with you request sooner, but illness and other pressing dutie have delayed action on our part.

Yours very truly,

Mark Morris,
Research Assistant.

MM:BY
Enclosures

Page Tightly Bound

Seeing is Believing

Here is an actual size, unretouched photograph of

THE TOLEDO TORCH

"Standard"

as you will receive it, ready to go to work on your job, and stay there until the job is done.

Toledo Pressed Steel Co. - - Toledo, Ohio

PLAINTIFF'S EXHIBIT 30

Circular Concerning Plaintiff's Open Flame Torch

Plaintiff's Exhibit No. 31.

PLAINTIFF'S EXHIBIT 31
No. 181,030.
Catalog Sheet Illustrating Device of Billingham Patent,

TAPER SLIDE AND KEY

Patented March 27, 1888

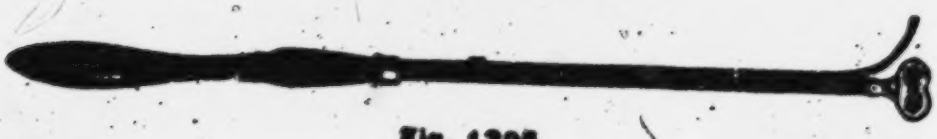


Fig. 1398

Nickel Dipped	per dozen,	$ 2.50
Nickel Plated	"	4.50
Brass	"	10.00

GAS KEY

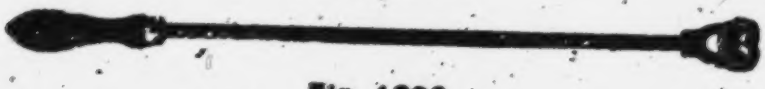


Fig. 1396

Per dozen $6.00

CURVE TAPER HOLDER

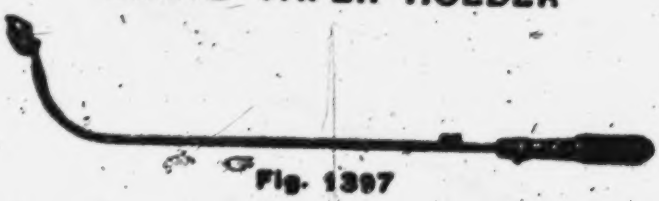


Fig. 1397

Per dozen $2.50

STRAIGHT TAPER HOLDER

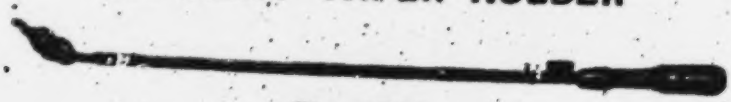


Fig. 1398

Per dozen $2.50

MIDDLE EXTENSION PIECE

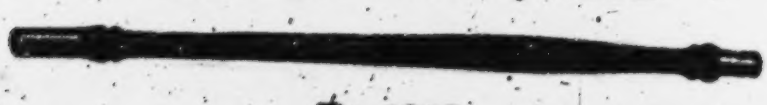


Fig. 1399

Per dozen $9.00

END EXTENSION PIECE

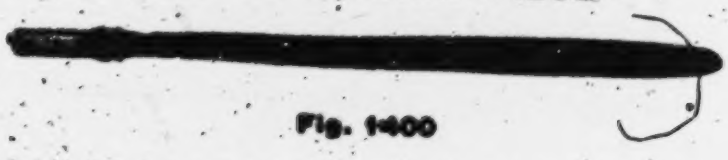


Fig. 1400

Per dozen $9.00

DEFENDANTS' EXHIBIT A
Toledo Pressed Steel Company Circular

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CASE NO. 1408 - 1418

DEFENDANT'S EXHIBIT

NO. A

THE TOLEDO TORCH

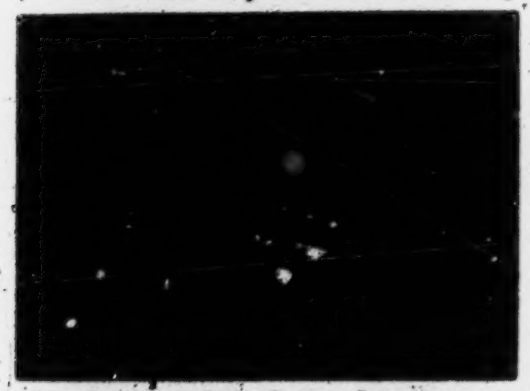


IT RIGHTS ITSELF

THE use of the Toledo Torch on construction work removes all liability of accidents. It is always seen and quickly understood, because it makes all of the hazard clearly visible.

It will burn through wind and rain for more than twenty-four hours, if necessary, on one filling.

It is made of pressed steel and is practically indestructible, with no parts to clean, adjust or replace. It is counter-weighted to make it always self-righting.



The very nature of its construction and its manner of operation confine its application to use on construction work. It is because of this fact that the experience of thousands of users prove there is practically no loss from theft.

The Toledo Torch will operate perfectly on the lower grades of fuel, such as light furnace oil, which makes this unbreakable and theft-proof warning signal more economical to operate than any other type of danger light.

If you have never seen Toledo Torches in operation or have never used them, you should do so at the first opportunity. Having been approved and recommended by The United States Fidelity & Guaranty Company and having received the A. G. C. Seal for Successful Performance, they are of proven merit. Nearly half of the state highway departments have adopted the Toledo Torch and the thousands of utilities and contractors who are also using them, find in them the solution to an expensive and troublesome problem.

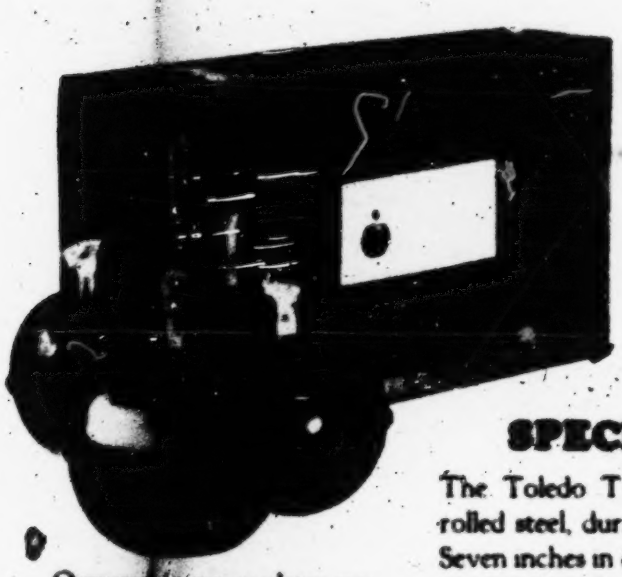


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DEFENDANTS' EXHIBIT A.

Toledo Pressed Steel Company Circular

Frt allowed on 18 A made



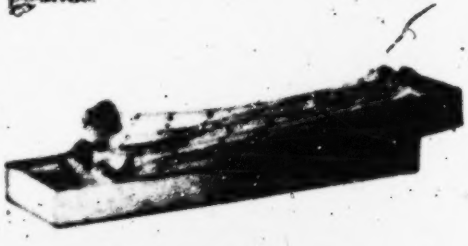
This box is the standard package. It contains six Toledo Torches. Freight is allowed on all single shipments of three (3) or more boxes. A discount of 10% is allowed on all single orders for one gross or more.

SPECIFICATIONS

The Toledo Torch is made from cold rolled steel, durably finished in baked enamel. Seven inches in diameter. Fuel capacity, seven-tenths of a gallon. Burns an average of twenty-four hours on one filling. Large ring for convenient handling. Double-seamed, leak-proof joint. Cast iron counterweight, electrically welded in place. Weight, unfilled, five and one-half pounds.

Ownership name plates may be welded on Toledo Torches, as shown above, at an additional cost of $1.25 per dozen in quantities of less than six dozen. They will be attached free on quantities over six dozen.

The standard wick furnished with the torch may be obtained in packages of one dozen, shipping charges prepaid. The performance of the torch is guaranteed, if the standard wick is used.



PRICES

TOLEDO TORCHES	$ 20.00 per dozen $216.00 per gross
STANDARD WICKS	$ 1.75 per dozen $ 20.00 per gross

For Shipment of Toledo Torches west of the Rocky Mountains add $4.00 per dozen to cover extra freight

Manufactured by

THE TOLEDO PRESSED STEEL CO.

[illegible] STREET and WOODRUFF AVE.

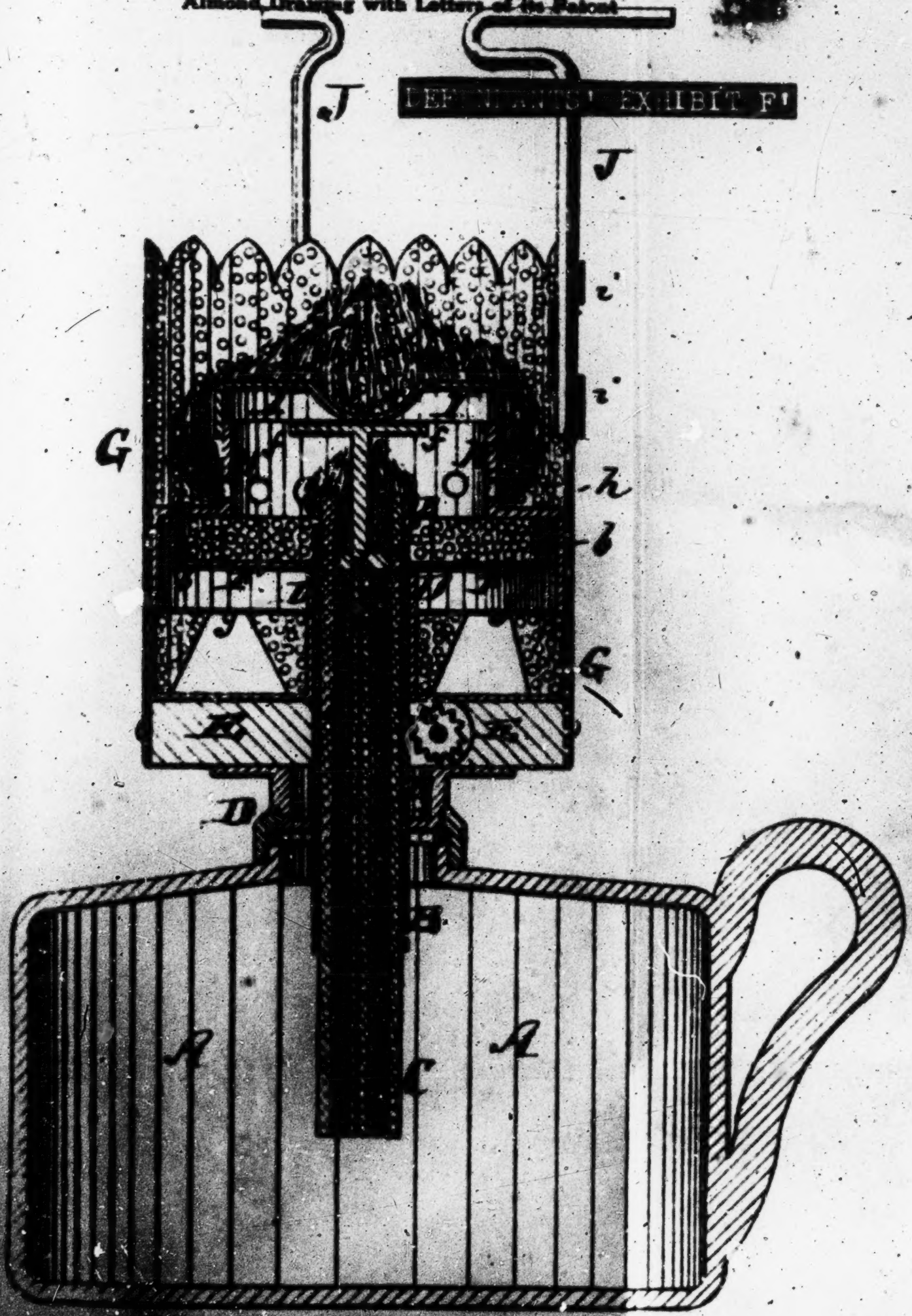
TOLEDO, OHIO

Fig. 1

DEFENDANTS' EXHIBIT F1.

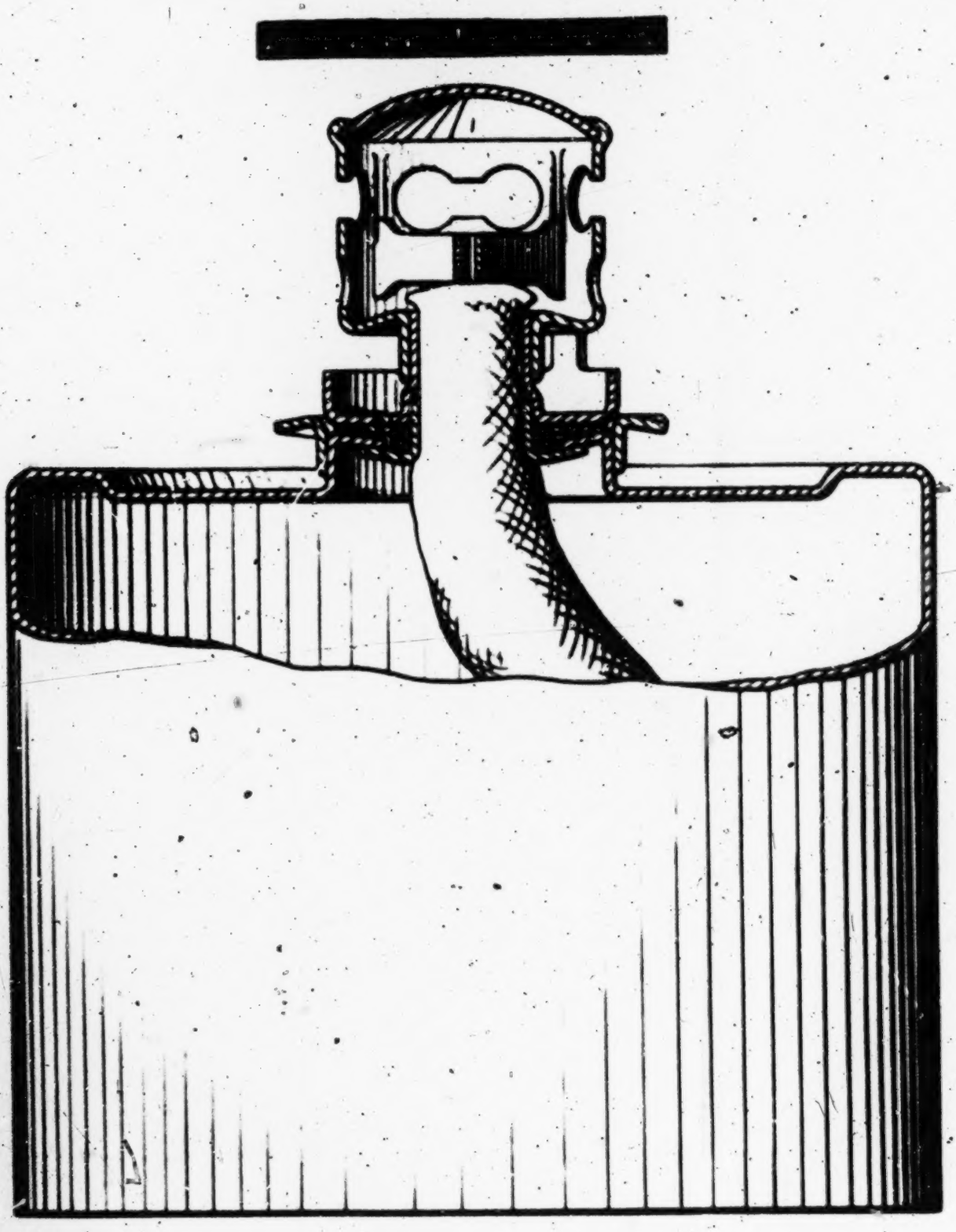
Almond Drawing with Letters of its Patent

219



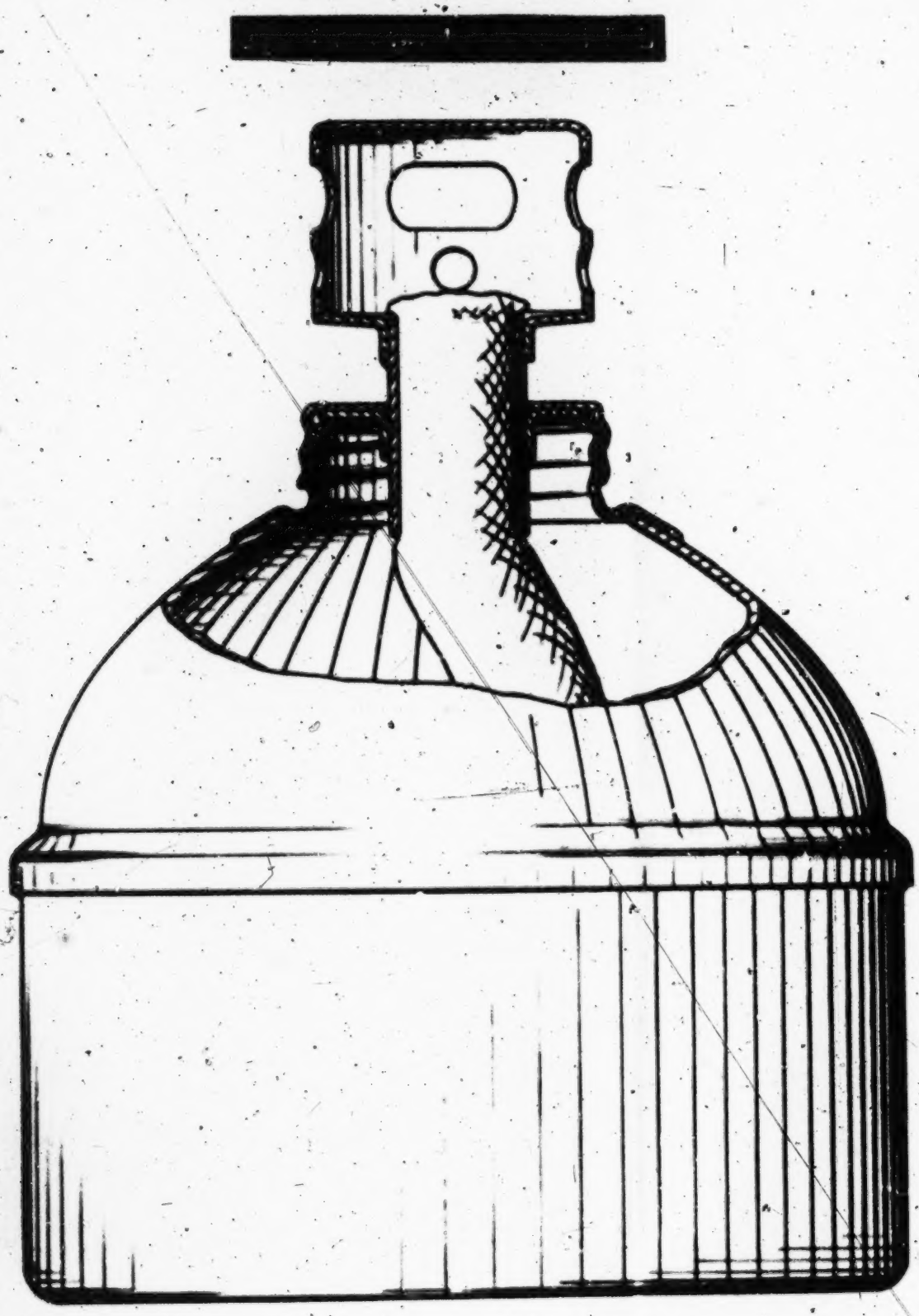
DEFENDANTS' EXHIBIT K

Drawing — Defendant's Flare Complained of —
Equity No. 1408 (Bolser)

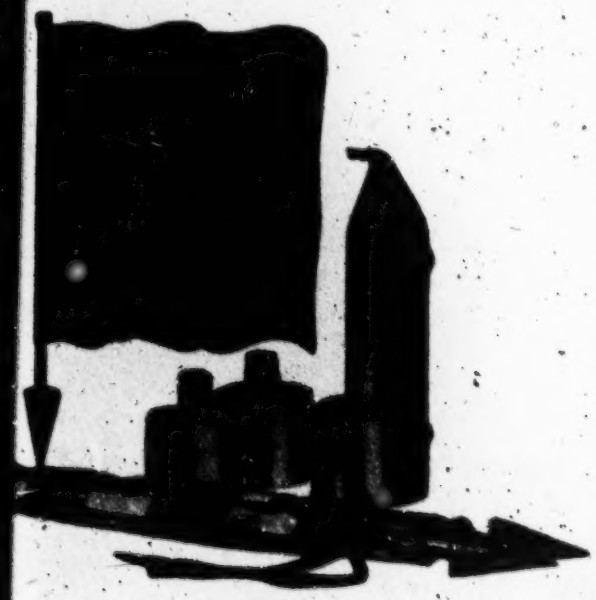


DEFENDANTS' EXHIBIT L

Drawing — Defendant's Flare Complained of — Equity No. 1412 (Kari-Keen)



...r Hi-Way Warning Flags ...or All Motor Vehicles



...Consists of 3 Flags and Heavy Canvas Bag

...re made of same material and con... used by major railroads for more ... years and in accordance with their ...ations. They are a proved product. ... flag 18 x 18 inches. Flag staff made ... inch clear birch. Finished with brown... Metal parts are cadmium plated ...nishing. Flag staff is jointed by heavy ...sleeve and has a spear shape metal point ...ily be driven into pavement joints, ...dirt, gravel or dirt road or shoulders.

...plete set of 3 flags and bag...**$2.00**

Genuine Bolser Flares—For Safety

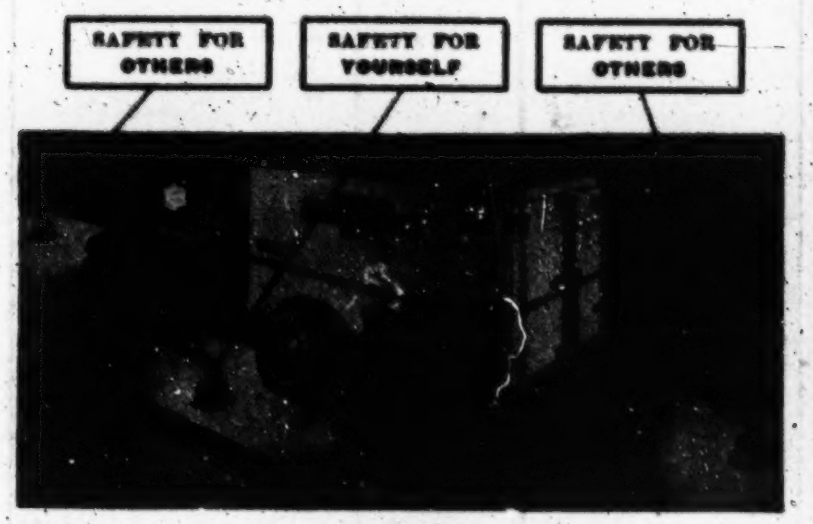
This Safety Feature PREVENTS Accidents

Liability insurance can rebuild a crashed car—pay a hospital bill—compensate for lost time, but *it* can't return the dead to life, or repair shocked and shattered nerves.

Protect *yourself* against the grief and pain of hurting others. Do your part to prevent the thousands of motor car accidents that occur every year because of stalled trucks, busses and cars being struck by speeding cars. Hundreds of thousands of others are barely avoided. Thousands of lives are lost—more thousands of people injured — millions of dollars worth of property damaged.

Your own good judgment says "Use Flares." Comparison and common sense say Use the Best Flares—the Genuine Bolser Flares—road tested and time tried.

Bolser Flares are your safety insurance. They are always ready for use—quickly set out or picked up—and more efficient than the law requires.



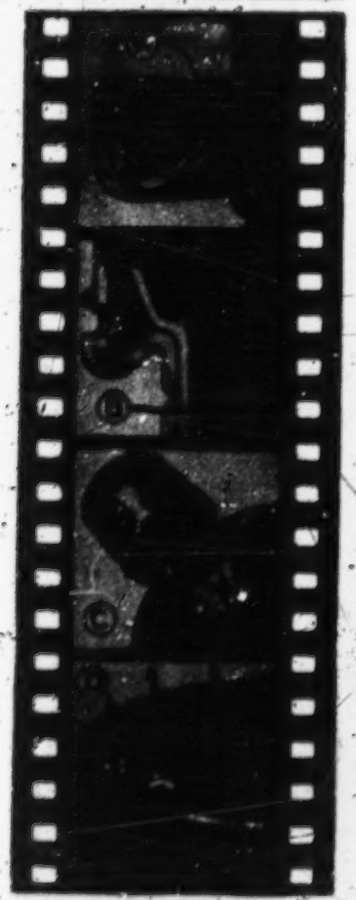
Distributors



Page Tightly Bound

Exclusive Features
found only in
Genuine Bolser Flares

No other flare of any kind provides all the features of construction and advantages in operation that are combined in Bolser Flares.



-NEW Valve Seat
FOUR Breather Channels
-NEW Burner Tip
-NEW Deflector Cap

Genuine BOLSER Flares

FOR TRUCKS ◆ BUSSES ◆ COMBINATION TRAILERS ◆ ETC.

Protected by U. S. Patent No. 1981429 other patents pending



Only

The greatest advance in flare construction of all time. Leak-proof, Gas-proof, Rattle-proof, Water-proof and Wear-proof.

SET OF 3

Complete with easily attached handy bracket that keeps flares safe and ready for instant use. The unique handle and locking arrangement makes them easy to set out or pick up. A quarter turn of the handle locks the nested flares into a compact, leak-proof, gas-proof, water-proof, wear-proof unit, which cannot rattle or be lost and is always ready for instant use.

This exclusive feature assures the operator of finding his flares in a serviceable condition when needed.



3 of these flares in each unit.

Approved by Highway Commissions and Insurance Companies All Over the United States



An achievement that challenges the wisdom of using any other flare. Built to give maximum years of profitable service. A thoroughly proved product.

SPECIFICATIONS

SHAPE: Round, flat top.
CAPACITY: Approximately 2 pints per flare.
FUEL: Kerosene.
BURNING TIME: Approximately 12 hours.
HEIGHT: 4-inch flare: 15¼ inches over all.
DIAMETER: 5 inches.
BURNER TIP: All weather shield and generator.
WICK: Round, ¾-inch.
FINISH: Lacquer — Green flare and orange holder.
HOLDER BRACKET: Pressed steel with spring locking device drilled for bolts.



The Standard [illegible] Truck Unit — 3 [illegible] flares — compact, [illegible] ready, easily [illegible] and packed [illegible] another load.



Boiser Flares Prevent Accidents

The BOLSER CORPORATION

Des Moines, Iowa U. S. A.

DEFENDANTS' EXHIBIT N

Patent No. 56,949—Gas Burner—Jones & Collins—August 7, 1866.

225

Jones & Collins.

Gas Burner.

No. 56,949. Patented Aug. 7, 1866.

Fig. 1.



Fig. 2.

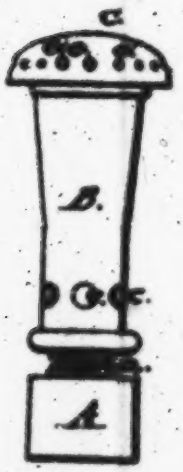


Fig. 3.



Witnesses:
Samuel A. Apgar
George Andrews

Inventors:
W. Jones and H. Collins
by their Atty
R. H. Eddy

UNITED STATES PATENT OFFICE.

WM. JONES AND M. H. COLLINS, OF CHELSEA, MASSACHUSETTS.

IMPROVED AERO-GAS BURNER.

Specification forming part of Letters Patent No. 56,949, dated August 7, 1866.

To all whom it may concern:

Be it known that we, WILLIAM JONES and MICHAEL HENRY COLLINS, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented an Improved Aero-Gas Burner; and we do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, and Fig. 3 a vertical section, of it.

The base part A of the burner we construct as a separate piece with reference to the body portion B, and connect the two by means of a male screw, *a*, and a female screw, *b*. Extending from the female screw in radial directions is a series of air-inlets, *c c*.

A discharge-passage, *d*, leads up through the body B and into a hollow dome or deflecting-cap, C, provided with a series of eduction passages or holes, *e e e*, leading out of it near its base.

The lower part A of the burner is made with or has a female screw, *f*, formed in it for the purpose of enabling it to be screwed upon a gas pipe or conduit. From the space within the screw *f* a passage, *g*, extends upward, and terminates in a smaller passage or hole, *k*, leading out of the top of the screw *a*.

The hole *k* is made so as to determine the amount of gas which, under ordinary pressure, is to be admitted into the passage *d*.

By removing the cap C, which simply fits on the top of the part B as the cover of a box is adapted to the body of such box, the ignited column of gas and air may be burned on the top of the part B; but when the cap C is in place on the part B the aero-gas column will be driven against the central part of the reflecting dome C, and by it will be deflected to and be caused to flow out of the several orifices *e*, where it may be inflamed. By such means the combustion will be spread and divided into numerous jets.

The air to mingle with the stream of gas, when passing into the passage *d*, will enter the holes *c c*, and pass into the space over the screw *a*, and from thence it will rush into the said passage *d*, when it will commingle with the gas and may be burned with it at the place or points of their discharge.

By revolving the part B on the screw *a* we can entirely close the orifices *c c*, or we can open them more or less, so as to gage or determine the amount of air which it may be desirable at any time to admit into the passage *d*. The air and gas so mixed will burn with a blue flame and give out much more heat than can be obtained from the gas alone.

By screwing down the part B, so as to entirely cover the air-inlets, no air will enter the burner, and consequently the gas alone will be inflamed on its top. Thus we are enabled to employ the burner for the purposes of illumination as well as those of heat.

We do not claim as our invention an aero-gas burner made with inlets for admitting air to the gas after its introduction into such burner.

We claim—

1. The improved aero gas burner—that is, one as made with or having a means of closing and more or less opening its air inlet or inlets, as specified.

2. The combination of the removable deflecting dome or cap C, made with eduction orifices in it near its base or lower part, with the aero-gas burner, as specified.

3. The peculiar mode, as described, in which to construct the aero gas burner—viz., by uniting its two parts A B by screws *a b*, and arranging the air-inlet holes of the upper part A, with respect to such screws, in manner as specified.

WM. JONES.
M. H. COLLINS.

Witnesses:
R. H. EDDY,
F. P. HALE, Jr.

DEFENDANTS' EXHIBIT N

Patent No. 66,021—Lighting Device—W. E. Heath—June 25, 1867.

226

W. E. HEATH.

Lighting Device.

No. 66,021. Patented June 25, 1867.

Fig. 1

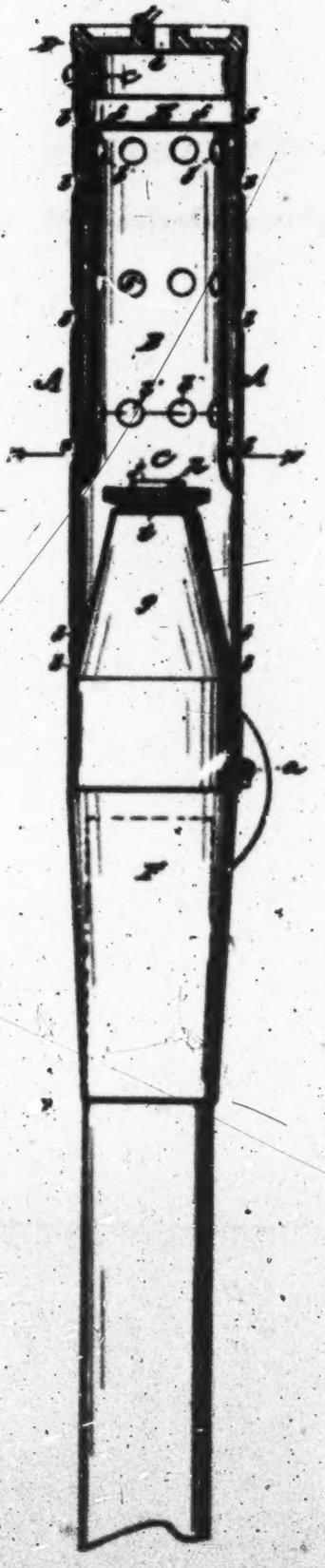


Fig. 4



Fig. 2



Fig. 3



Witnesses:

Inventor:

United States Patent Office.

WILLIAM EDWIN HEATH, OF PEMBROKE TERRACE, GREAT BRITAIN, ASSIGNOR TO JOSEPH WEATHERBY BARTLETT, OF NEW YORK CITY.

Letters Patent No. 61,021, dated June 25, 1867.

IMPROVED TORCH FOR LIGHTING GAS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM EDWIN HEATH, of Pembroke Terrace, Gloucester Road North, in the county of Middlesex, Kingdom of Great Britain, have invented "a new and improved Mode of Lighting Street and other Gas Lamps;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The said invention consists chiefly in the construction of a lamp, with a peculiarly constructed case or covering, in which, while allowing a free entrance to the air in sufficient quantities to support the combustion of the said lamp, will yet prevent the flame thereof being extinguished by the wind or rain when the lamp is being carried through the streets. The said invention also consists partly in the means for opening and closing the cocks of the gas-burners when the same are lighted and extinguished.

Description of the Drawings.

Figure 1 is a longitudinal section of the apparatus.

Figure 2 is a transverse section of the same on the line *x x*, fig. 1.

Figure 3 shows a burner provided with the required means for operating the cock thereof.

Figure 4 is a plan of the top of the interior tube.

Like letters refer to corresponding parts in each of the figures.

The case or cover consists of an outer and inner tube, A and B, the comparative diameters thereof being such that when the latter is placed inside the former an annular space is left between the two. The outer tube is extended to fit over the end of the lamp C, to which it is secured by the catch *a*. These tubes are formed of tin or other suitable metal, and are provided with the holes or perforations *b* through which air is admitted to the lamp. The two tubes are so arranged, with regard to each other, that the perforations *b*, in the outer tube A, lie between those in the inner tube B, as shown in figs. 1 and 2, so that the air in entering through the apertures *b*, in the outer case, is checked and prevented entering directly into the case or cover. By this means the flame of the lamp, while freely supplied with air, is effectually sheltered from the effects of the wind and rain, and the apparatus can be safely carried in the open air without danger of extinguishing the said flame. The outer case A is also extended above the inner tube B, and is provided with a cap or top, D, which is secured to the former by the screw *c* or by other suitable means. The said cap is formed with the boss or projection *d* around the aperture *e*, to prevent the entrance, through the said aperture, of water, which in wet weather might be caught and held by the said cap. The raised rim is provided to enable the burner cocks to be readily opened and closed. The top of the inner tube B is also provided with a cover, E, provided with the apertures *f*.

The lamp C is by preference constructed of brass, and of suitable form and size to hold conveniently the required quantity of oil. The neck *g* of this lamp is made conical or tapering, and is provided at its upper end with a flange or rim, *h*, which, for convenience, is formed on the screw *i*. The said lamp is also provided with a wick-tube, *j*, wherein a wick is introduced in the ordinary manner. The lamp C is also furnished with the socket F, which is by preference formed of tin and soldered to the lower part of the said lamp. One end of a light pole, or rod of cane, or other suitable wood or material, is inserted into this socket, and the apparatus is thereby conveniently carried from place to place with its lamp burning.

To enable the apparatus to be effectually used it is necessary that the plugs of the burners to be lighted thereby should be provided with the double handle G, represented in fig. 3, which may be easily applied to ordinary gas-cocks already in use, by forming a flange on the double handle to correspond with the handle of the said cocks, and uniting them by screws or rivets. The plug H is prevented turning more than a quarter of a revolution in either direction, either by means of the recess *k*, or by providing the plug with two of the pins or stops *l*. When the burner is to be lighted the apparatus is inserted through the bottom of the lamp, till its end, coming in contact with the handle, turns it over into the position represented in dotted lines. The cock of the burner is thus opened, and the gas escaping therefrom, entering through the apertures *b* and *b'*, comes in contact with the flame of the lamp C and is thereby lighted. To turn off the gas the apparatus is again inserted through the opening in the bottom of the lamp till it strikes the wing *m* of the handle G, which is thereby turned back into the position shown in full lines in fig. 3, and thereby closes the burner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The construction of the double case or cover having the perforated tubes A and B arranged one within the other, for the purpose and substantially in the manner set forth.

2. The double handle G, adapted either for burners constructed as shown in fig. 3, or for ordinary gas-burners, for the purpose and substantially in the manner set forth.

3. The apparatus consisting of the tubes A and B, cap D, lamp C, and socket F, constructed and combined for the purpose and substantially in the manner set forth.

W. E. HEATH.

Witnesses:
W. R. LAKE,
GEORGE HASELTINE.

DEFENDANTS' EXHIBIT N

Patent No.—116,573—Radiating Hydrocarbon Burners —Michael B. Dyott—July 4, 1871.

231

Michael B. Dyott's Impl in Radiating Hydro-carbon Burners

116573

PATENTED JUL 4 1871

Fig. 1.

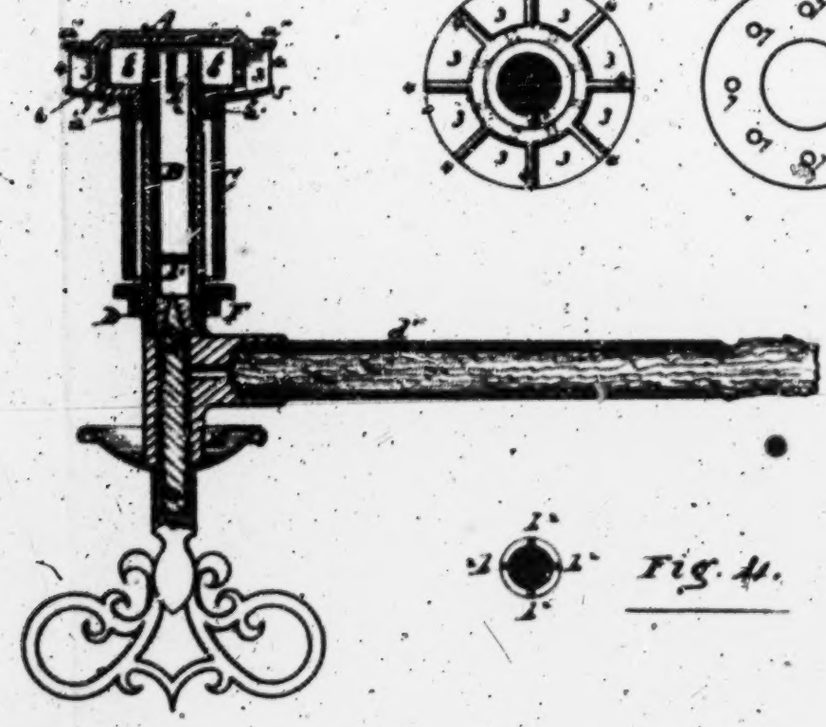


Fig. 2.



Fig. 3.

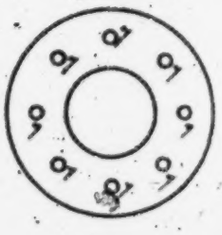


Fig. 4.

Witnesses:

Jno. Morrison

Wm. H. Morrison.

Inventor:

Michael B. Dyott

116,573

UNITED STATES PATENT OFFICE.

MICHAEL B. DYOTT, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. 116,573, dated July 4, 1871.

To all whom it may concern:

Be it known that I, MICHAEL B. DYOTT, of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Radiating Vapor-Burners for Lamps, of which the following is a specification:

The first part of my invention relates to the separation of radiating jets of mingled air and hydrocarbon vapor by surrounding them respectively with projecting guards for the purpose of affording thereby extended heating surfaces around the jets, protecting the ignited jets from accidental currents of air, and producing greater expansion, brilliancy, and uniformity in the flames radiating therefrom. The second part of my invention relates to the introduction of a slender stream of fresh external air into contact with each of the jets within the surrounding guards, by means of a small vertical hole made through the under side of the said guard; the object of this part of my invention being to further whiten the flame by intensifying the combustion of the said vapor jet. The third part of my invention relates to the attachment, to the under side of the burner-head, of a hollow cylinder concentric with a perforated tube, which mingles and conducts the air and vapor together to the said head so as to form an annular guard, open at its lower end, around the said perforated tube; the object of this part of my invention being to protect the said perforated tube from all lateral currents of cold air and to better protect it from any danger of having the perforations accidentally obstructed. The fourth part of my invention relates to the extension of the vapor and air-mingling and conducting-tube upward nearly to the under side of the top plate of the burner-head, and slotting or perforating that part of the same which thus projects within the head, for the purpose of giving the same more heating surface and also causing a more uniform flow of the air and vapor through the said head.

Figure 1 is a vertical central section of the burner of a hydrocarbon lamp embodying my invention. Fig. 2 is a plan view of the under side of the top plate of the burner-head without its bottom plate. Fig. 3 is a plan view of the said bottom plate. Fig. 4 is a plan view of the slotted upper end of the air and vapor-mingling and conducting-tube of the burner.

The head A of the burner consists of a short cylinder closed at its upper end and having a central opening surrounded by a downward-projecting flange, a', in its lower end, whereby it is screwed fast over the open upper end of the perforated tube B, which mingles and conducts the vapor and air into the said head. Around the upper end of the cylindrical head A there is a flange, a'', which forms the cover of a series of apartments, 3 3, produced by radial partitions 4 4.

The open under sides of the said apartments 3 are closed by a disk, 5, (see Fig. 3,) which fits around the flange a' and is held in close contact with the radial partitions by means of the hollow cylinder C, which is screwed firmly up against the disk, when the same are so applied around the flange a'. (See Fig. 1.) The lower end of the tube B is screwed fast to the upper end of the boss D which contains the valve-stem d^1 and its seat, and communicates with the wick-tube d^2 that leads to the fountain or reservoir—not shown. Just above the junction of the tube B with the boss D there is a surrounding series of small air-holes, b', in the former, and through these holes the air enters the tube and becomes mingled with the vaporized fluid rising from the valve below. Around the lower end of the tube B a traversing flange, F, is fitted so that it can be moved toward or from the open mouth of the cylinder C, for the purpose of regulating the flow of air into the tube to suit the requirements of the particular hydrocarbon fluid used in the lamp. The upper end of the tube B has vertical slots b'' b'' cut in two vertical planes which are at right angles to each other. (See Figs. 1 and 4.) A jet-hole, 6, is made through the middle of the back part of each of the apartments 3 into the interior of the head A, and also an air-hole, 7, leading into each of the compartments 3 through the bottom of the latter. (See Figs. 1 and 3.) In starting the burner the valve is opened and the little dish E filled with some naphtha or its equivalent, and ignited, whereby the boss D, tube B, and head A become heated sufficiently to vaporize the hydrocarbon liquid running through the valve, and also to warm the air which enters the series of holes b', the said vapor and air together passing into the heated head A and escaping through the jet-holes 6 in radial streams, which, becoming ignited and supplied with fresh streams of air from the holes 7, the required brilliant radial jets of flame are produced, the said jets of

flame keeping the head A and tube B sufficiently heated to keep up the vaporization of the hydrocarbon fluid rising through the valve after the naphtha in the dish E has become consumed.

I do not intend to confine the construction of the head A to the mode described, as it is obvious that the same may be constructed by corrugating the outer edge of the flange *a*", so as to form the apartments 3, or cast solid and the apartments or cavities drilled out, or casting them with the head.

I claim as my invention—

1. The apartments 3 3, in combination with the vapor-jet holes 6 6, when the said apartments are each formed so as to be open only at the perimeter of the burner-head and the said vapor-jet holes each arranged so as to discharge its jet of vapor horizontally through its particular apartment, substantially as and for the purposes hereinbefore set forth.

2. The fresh-air-supplying holes 7 7, in the apartments 3 3, in combination, respectively, with the radiating jet-holes 6 6 in the head A, substantially as and for the purposes hereinbefore set forth.

3. The annular guard C, when constructed and applied substantially as and for the purposes hereinbefore set forth.

MICHAEL B. DYOTT.

Witnesses:

BENJ. MORISON,

WM. H. MORISON.

DEFENDANTS' EXHIBIT N

Patent No. 147,496—Lamp Burners—W. Hathaway—February 17, 1874.

233

W. HATHAWAY.

Lamp-Burners.

No. 147,496. Patented Feb. 17, 1874.

Fig. 1.

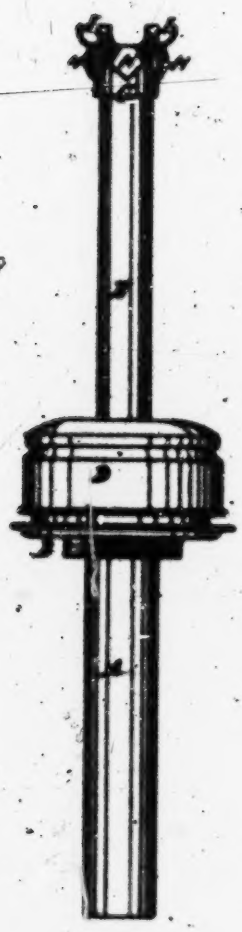
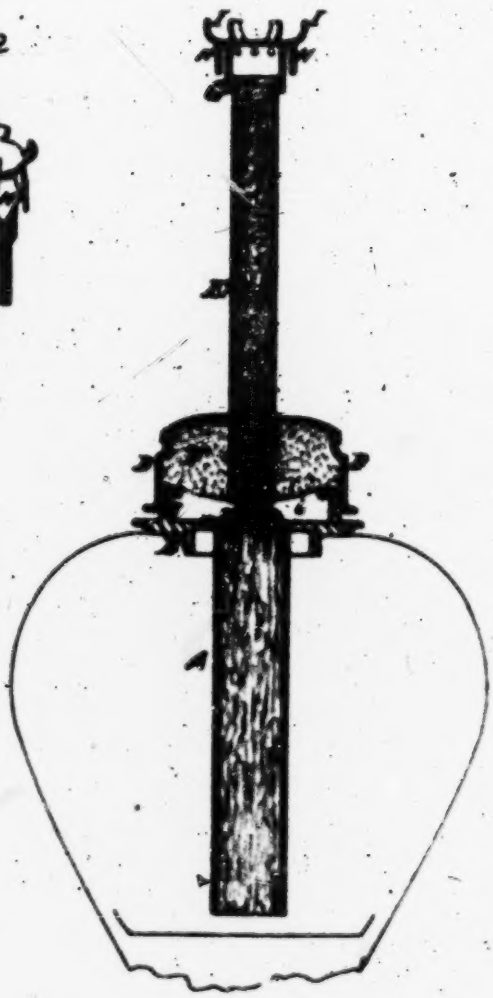


Fig. 2.



Fig. 3.



Witnesses

John L. Dorne

E. Milton Richardson

Welcome Hathaway

by Dewey & Co

Attys

UNITED STATES PATENT OFFICE.

WELCOME HATHAWAY, OF OPHIR, CALIFORNIA.

IMPROVEMENT IN LAMP-BURNERS.

Specification forming part of Letters Patent No. **147,496**, dated February 17, 1874; application filed December 18, 1873.

To all whom it may concern:

Be it known that I, WELCOME HATHAWAY, of Ophir, county of Placer, State of California, have invented an Improved Burner for Lamps; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to an improved burner which is especially adapted for burning gasoline and other light products of a similar nature, such as are brought to the burner and vaporized previous to being ignited.

My invention consists in a cap or coupling for holding the upper part of the wick-tube, and so constructed that it contains a removable non-conducting substance and a small gas-chamber. It also consists in a peculiarly-constructed burner, as more fully hereinafter described. A combination of inflammable and non-inflammable substances is employed to conduct the gasoline or other fluid to the vaporizer and burner.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1 is a side elevation of my device. Fig. 2 is a view of the burner or cap. Fig. 3 is a sectional elevation of the device.

A is the tube, which is made of such length that it will reach from near the bottom of the lamp or receptacle for the liquid to a point just above the top of it. A screw-cap, B, fits into the top of the lamp in the ordinary manner, and just above this screw is another screw-cap, C, which forms the lower part of the coupling. The upper part of the coupling D fits down upon the screw C, and has a hole through its top somewhat larger than the tube E. The interior of the part D is closely filled by a cork, F, through which the tube E passes, fitting closely, and is thus prevented from touching the sides of the coupling D. This makes the device non-conducting, and no matter how hot the tube E may become, the heat will not pass down so as to affect the tube A. A broad flange is formed upon the top of the screw C, and when the parts are screwed together, a tight joint will be formed by the cork which presses upon the flange, and a small gas-chamber, *i*, left beneath the cork.

The lower tube A may be filled with cotton-wicking; but the upper tube E should be filled with asbestus, which will not be acted upon by heat, the asbestus just resting upon the wick when the parts are united.

The burner or vaporizer G is placed at the top of the tube E, and consists of a cap which fits upon the top of the tube. This cap is closed at the top, and has a series of horizontal holes around it near the top. A series of lips, H, are formed to bend down from the top all around the cap and between the jet openings, so that each jet passes out between two of these lips, and is thus protected from air-currents, as while the lamp is being carried from place to place, so that it is not easily extinguished. Above the jet-openings are a series of lugs, I, which may be bent upward or more horizontally if it is necessary to have a greater heat for more perfect vaporization and combustion; and by this construction I am enabled to make my burner adjustable.

Different caps of various sizes and shapes may be employed for larger or smaller lamps; but by means of the lips H and adjustable projections I, I am always enabled to regulate and protect the flame.

The coupling C D, with its non-conducting packing, renders it impossible to overheat the liquid in the lamp, while, by extending the tube A to the bottom of the lamp inside, it will not be possible to ignite the liquid from the burner.

By making the tube E somewhat smaller than the tube A, the liquid will be carried to the burner more readily.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The burner G, consisting of the horizontally-perforated cap provided with the lips H and the adjustable lugs I, substantially as and for the purpose herein described.

2. The bisected wick-tube A E, in combination with the flanged screw-cap C, cap D, and removable non-conducting material F, constructed and arranged to form the gas-chamber *i*, as set forth.

In witness whereof I hereunto set my hand and seal.

WELCOME HATHAWAY. [L. S.]

Witnesses:

JOHN L. BOONE.

C. MILTON RICHARDSON.

DEFENDANTS' EXHIBIT N

Patent No. 181,030—Torches for Lighting Street Lamps —F. Billingham—August 15, 1876.

235

F. BILLINGHAM.

TORCHES FOR LIGHTING STREET LAMPS.

No. 181,030. Patented Aug. 15, 1876.

FIG. 1.

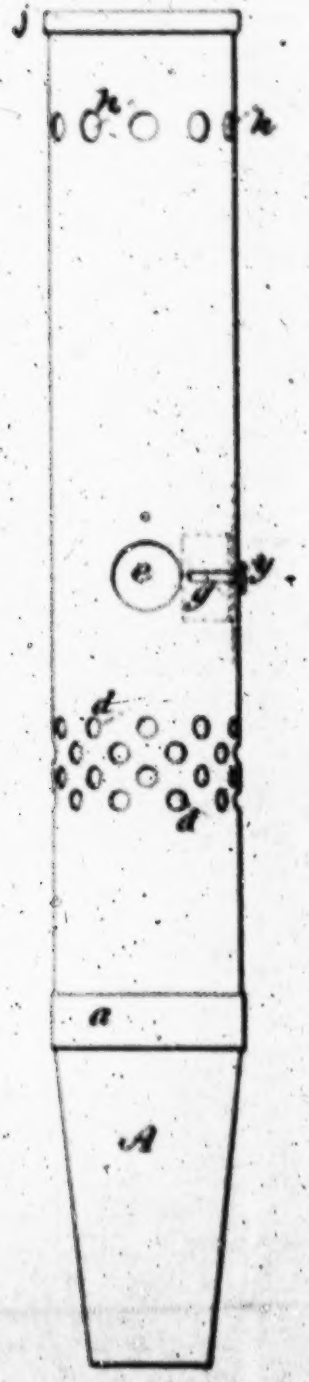


FIG. 3.

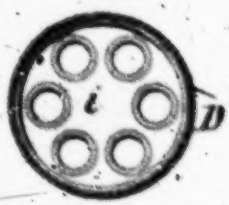


FIG. 4.



FIG. 5.

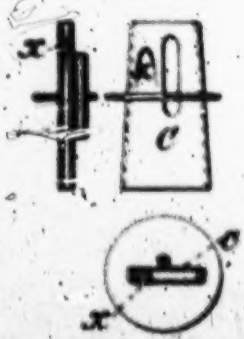
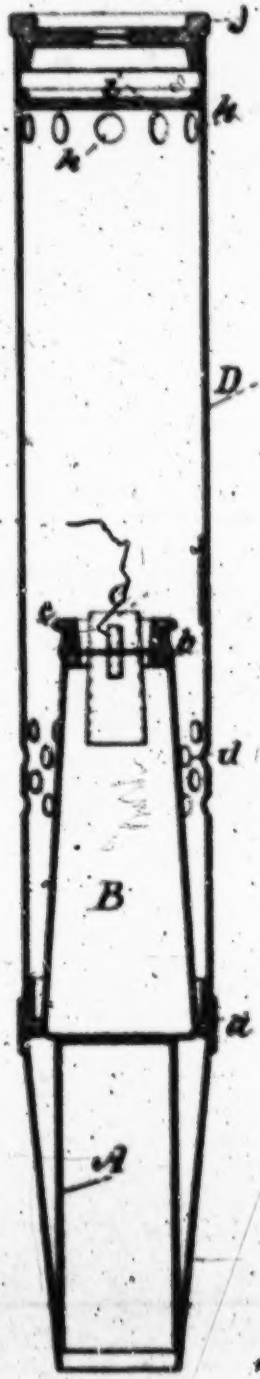


FIG. 2.



WITNESSES.

Wm. H. Burke

John. Cook

Spencer Billingham by Chas. Sidney Devane atty

INVENTOR.

UNITED STATES PATENT OFFICE.

FRANCIS BILLINGHAM, OF NEW YORK, N. Y., ASSIGNOR TO E. P. GLEASON MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN TORCHES FOR LIGHTING STREET-LAMPS.

Specification forming part of Letters Patent No. 181,030, dated August 15, 1876; application filed July 20, 1876.

To all whom it may concern:

Be it known that I, FRANCIS BILLINGHAM, (assignor to the E. P. GLEASON MANUFACTURING COMPANY,) of the city, county, and State of New York, have invented, made, and applied to use Improvements in the Construction of Torches for Lighting Street-Lamps; and that the following is a full, clear, and correct description of my invention, reference being had to the accompanying drawing, making part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a side elevation of my improved torch. Fig 2 is a sectional view of the same. Fig. 3 is a view of the top of the torch, the cap being removed. Fig. 4 is a view of the portion of the torch provided with sliding plate and opening for lighting the lamp. Fig. 5 are views showing the construction of the wick-tube.

In the drawing, like parts of the invention are pointed out by the same letters of reference.

The nature of the present invention consists in improvements, as more fully hereinafter set forth, in the construction of torches for lighting street-lamps; the object of the invention being the production of a torch for lighting street-lamps efficient in operation, and produced at a low cost.

To enable those skilled in the arts to make and use my invention, I will describe the construction and operation of the same.

A shows a socket formed of tin or any suitable metal, in which may be inserted one end of the pole of wood or suitable material for supporting the torch. The upper portion of the socket is flanged, as at *a*, and upon the interior of the same is cut a screw-thread, with which engages a screw-thread formed upon the base of the upper portion of the torch, as hereinafter described. B shows the lamp soldered or attached in any convenient manner to the socket A. This lamp is made conical, and in it is received the oil to be supplied to the wick. C shows the wick-tube of the lamp made in ordinary manner, save that a portion of the metal of which the tube is formed is cut lengthwise, and is then forced in and beyond the face of the interior of the tube, and forms, as it were, a lip or tongue, *x*, projecting inward, and serving to retain the wick in position within the tube C. The top of the lamp is flanged, as at *b*, and provided with a screw-thread, with which, after the wick-tube has been placed in position, a threaded cap or nut, *c*, engages, and holds the wick-tube C in position. The upper portion of the torch consists of a tube, D, screw-threaded at its base to engage with the upper portion of the socket A, and intended to be placed over the lamp B. The tube D is provided with a series of perforations, *d*, so positioned that when the tube D is united to the socket A these perforations *d* shall be about midway between the base and the top of the lamp, and are intended to allow air to be supplied to the flame to support combustion. It is also provided with an opening, *e*, placed so that when united to the socket A this opening shall be a little above the top of the wick-tube C, and thus admit of the lighting of the wick without disconnecting the upper and lower portions of the torch. The opening *e*, after the lamp has been lighted, is closed by a sliding plate, *f*, placed upon the interior of the tube D, and is retained in position, and moved forward or back, by means of a headed pin, *y*, passing through a slot, *g*, in the tube D, and having its bearing in the plate *f*. The tube D is further provided with a series of perforations, *h*, near its upper end; and upon the interior, a short distance above these perforations *h*, is a perforated disk of metal, *i*, for deflecting the flame. The upper end of the tube D is threaded upon its interior, and with the same engages the threaded base of a cap or disk, J, secured upon the upper portion of the torch, to prevent the extinguishment of the same from rain or other causes.

Such being the construction, the operation may be thus described: The lamp is first filled, the wick placed in the wick-tube, and retained in the proper position therein by the lip or tongue *x*, formed as described, and the upper portion D of the torch is secured upon the lower portion of the same. The plate *f* may now be drawn away from its position within the opening *e* in the tube D, and, a lighted match having been inserted into the same, the wick

of the lamp is lighted. The opening *e* is then closed by moving forward, by means of the headed pin *g*, the plate *f*, which fills the opening.

To light a street lamp: The cock of the same having been opened to allow of the supply of gas to the burner, the openings or perforations *h* are brought into proximity with the burner, and the flame, issuing through these perforations *h*, and deflected by the disk of metal *i*, lights or ignites the gas. As previously stated, air is supplied to the lighted wick through the perforations *d*, and combustion is thus maintained.

When desired to extinguish the lamp the sliding plate may be withdrawn from its position within the opening, and the lamp may be blown out.

A torch thus made can be afforded at a low rate to the consumer, and will be found efficient in its operation.

Having now set forth my invention, what I claim as new is—

The combination of the threaded socket A, lamp B, wick-tube C, threaded tube D, provided with the perforations *d* and *h*, and opening *e*, and sliding plate *f*, and disk *i*, and cap J, constructed and operating substantially as and for the purposes specified.

FRANCIS BILLINGHAM.

Witnesses:
E. P. GLEASON,
E. F. GENNERT.

DEFENDANTS' EXHIBIT N

Patent No. 192,130—Lamps for Heating a Tailor's Goose —J. Reekie—June 19, 1877.

239

J. REEKIE.

LAMPS FOR HEATING A TAILOR'S GOOSE.

No. 192,130. Patented June 19, 1877.

Fig 1.

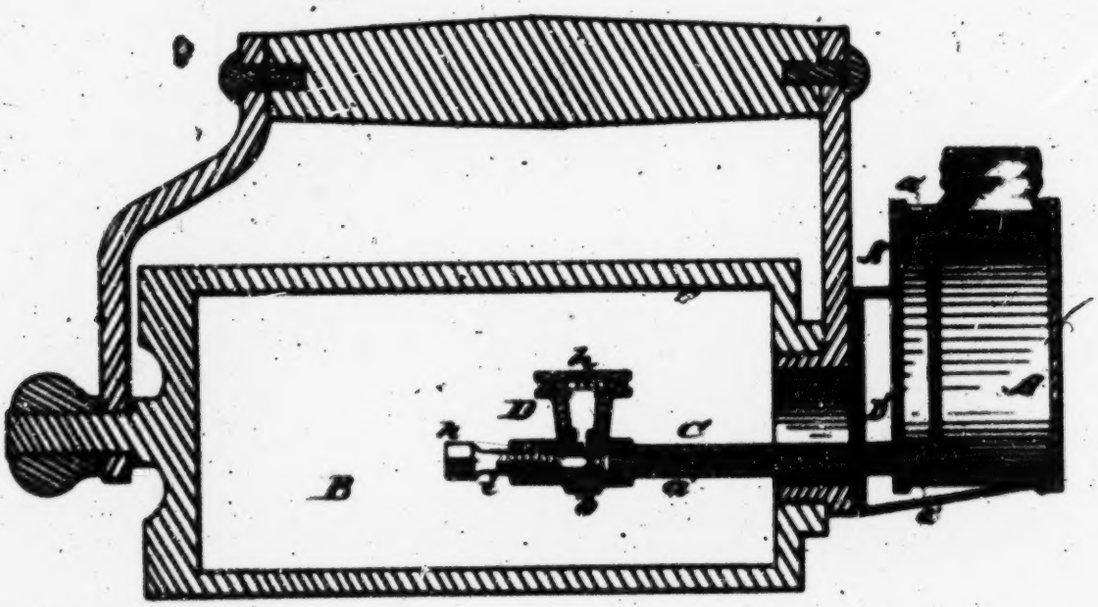


Fig 2.

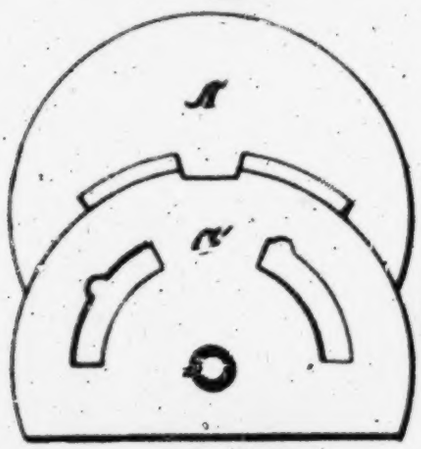


Fig 3.

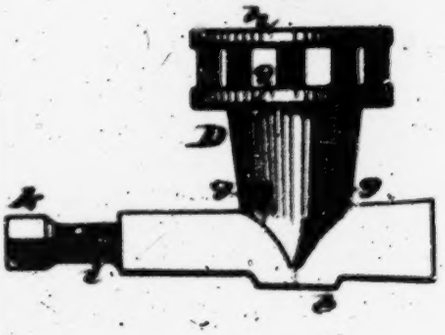
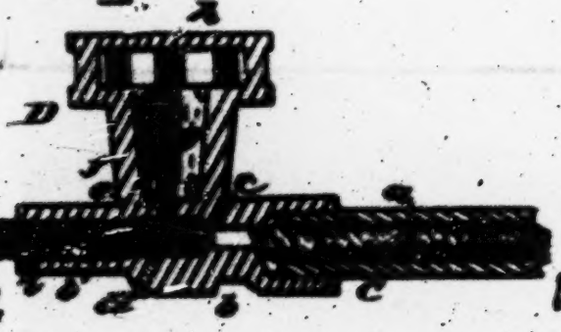


Fig 4.



WITNESSES:
Jno. F. Dahamel
M. M. Gill

INVENTOR
James Reekie
PER
A. C. Hollister
ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES REEKIE, OF MARTLING, MISSOURI.

IMPROVEMENT IN LAMPS FOR HEATING A TAILOR'S GOOSE.

Specification forming part of Letters Patent No. 192,180, dated June 19, 1877; application filed April 2, 1877.

To all whom it may concern:

Be it known that I, JAMES REEKIE, of Martling, in the county of Newton and State of Missouri, have invented certain new and useful Improvements in Lamps for Heating a Tailor's Goose; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same.

The invention consists in a lamp capable of detachable connection with a tailor's goose, provided with a vapor-burner of peculiar construction, as hereinafter specified.

In the drawing illustrating my invention, Figure 1 is a longitudinal section of the lamp and goose connected. Fig. 2 is a front view of the lamp with the burner wick tube in cross-section, showing the means upon the lamp for securing it to the goose. Fig. 3 is a side elevation of the burner, and Fig. 4 a longitudinal section of said burner and a portion of the wick-tube.

The essential characteristic of a goose adapted to receive my invention is a hollow interior, into which the burner of the lamp may extend. Such a goose, as ordinarily constructed, has means for the attachment of the lamp. It has also two ironing or smoothing surfaces, so that while one of such surfaces is being used the other is being heated ready for use.

My lamp consists of an oil-chamber, A, provided with a dead-air chamber, A′, having openings *a′* at the bottom and top, to permit of the passage of air caused by expansion. The bust C′ forms another air-chamber, D′, open at the sides (shown in Fig. 1), to allow of the free passage of air. By this construction non-conducting air-chambers are interposed between the oil-chamber and the heated iron for the purpose of retaining the oil at its ordinary temperature.

The bust is provided with bayonet-slots, as seen in Fig. 2, or other means for securing it to a goose, B. From the lower end or bottom of this chamber extends a tube, C, in which the wick *a* is placed.

Detachably connected to the end of the tube C is the burner D. This burner is constructed of a tube, *b*, the interior or bore of which is contracted at *c*, forming thereby a seat for a valve, *d*. This valve *d* may be continuous of a screw, *i*. The said screw *i* has a head, *k*, for adjusting it in the threaded portion *b′* of the tube *b*, which adjustment locates the valve *d* with reference to its seat *c*, thereby regulating the size of the opening in the tube.

A vertical slit, *e*, is made in the upper wall of the tube *b*, centrally of a core, *f*, that rises from the said tube. A number of air-inlets, *g*, are made in this core, and it is surmounted by a flame-deflector, *h*.

I do not confine the application of my lamp to a tailor's goose, for it may be used also with any self-heating sad-iron.

The operation is as follows: Sufficient heat being obtained to vaporize the fluid—as, for instance, gasoline—the gas issues from the slit *e* into the core *f*, where the air-inlets are located, and where the gas is ignited, and, rising therein, finds an exit beneath the deflector, which latter serves to diffuse it horizontally, and thereby distribute the heat throughout the iron or goose.

This core, with its air-inlets and deflector, acts very much like a blow-pipe, and produces an intense and quick heat.

The quantity of vapor allowed to escape is regulated by adjusting the valve *d* in its seat so as to govern the size of the opening in the tube *b*.

By this construction a cheap oil or other inexpensive fluid may be substituted for alcohol, and better results obtained.

What I claim is—

1. The combination of the oil-chamber A, air-chambers A′ and D′, tube C, adjustable valve and burner, with a tailor's goose, all constructed, arranged, and operating as shown and described.

2. The tube *b*, adjustable valve *d*, slit *e*, and core *f*, in combination with a deflector, *h*, substantially as shown and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES REEKIE.

Witnesses:
G. H. HOVEY,
W. MACBURNIE.

DEFENDANTS' EXHIBIT N

Patent No. 193,796—Vapor Burners for Heating Purposes—T. R. Almond—August 7, 1877.

241

T. R. ALMOND.

VAPOR BURNERS FOR HEATING PURPOSES.

No. 193,796. Patented Aug. 7, 1877.

Fig: 1

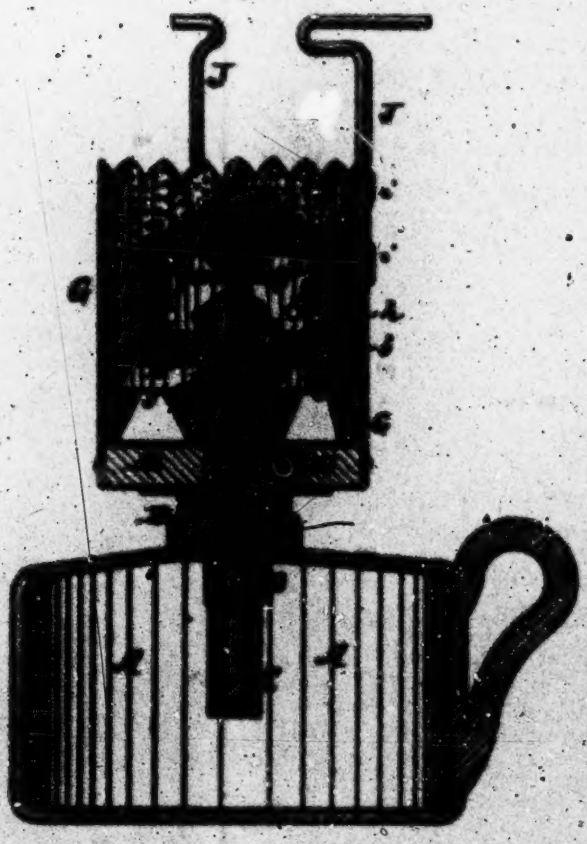
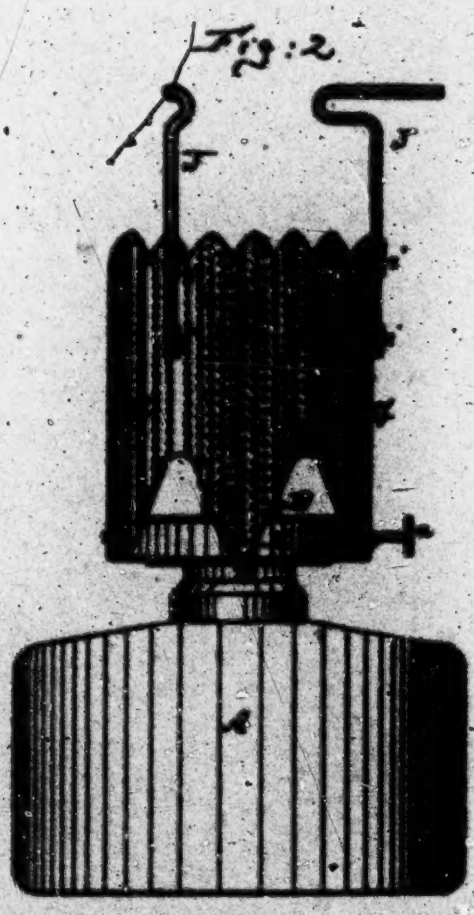


Fig: 2



Witnesses
D. Phillips
J. Finch

Inventor:
Thos. R. Almond
by his Attorney
Alex. Bruce

UNITED STATES PATENT OFFICE.

THOMAS R. ALMOND, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN VAPOR-BURNERS FOR HEATING PURPOSES.

Specification forming part of Letters Patent No. 193,796, dated August 7, 1877; application filed December 15, 1876.

To all whom it may concern:

Be it known that I, THOMAS R. ALMOND, of Brooklyn, in the county of Kings and State of New York, have invented a new and improved Burner for Heating Purposes, of which the following is a specification:

Figure 1 is a sectional elevation of a lamp carrying my improved burner. Fig. 2 is a side view of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to an improved lamp-burner for heating purposes, the object being to vaporize, by an inner flame, the fuel of the lamp, and to produce a heating-flame by igniting said vapors or other gases.

The invention consists, first, in the combination of a sliding wick-tube, which is moved up and down with the wick through a fixed annular plate, with a top plate, which, when drawn down, serves as an extinguisher.

The invention also consists in providing said annular plate with perforations, or with a perforated rim, and in combining it with a burner superposed chamber, and with a perforated outer chimney, all as hereinafter more fully described; also, in the use of a hinged cap, and in the new arrangement of brackets for supporting the vessel to be heated.

In the drawing, the letter A represents the reservoir of a coal-oil lamp. B is the wick-tube, and C the wick thereof. The wick-tube is arranged to slide up and down in a hollow guideway, D, that projects from the lamp-reservoir. In this guideway the ratchet-wheel a, for moving the wick-tube, has its bearing.

A washer or other bad heat-conducting [illegible] E, is rightly affixed to the tubular guideway D, and elevated sufficiently far from the reservoir A to keep the flame above from unduly heating the reservoir. This block, together with the tube D, is, by preference, covered with asbestus paper or other non-combustible substance. The upper end of the tubular guide D terminates in an enlargement or flange, F, in form of an annular plate of slightly smaller diameter than the block E. The plate F has an upwardly-projecting perforated rim, b, or is itself perforated.

The wick-tube has an inner cross-bar, d, upon which is mounted the vertical stem e of a top plate, f. This top plate is at a distance above the upper end of the wick, and larger in diameter than the wick, as shown in Fig. 1. By means of the ratchet-wheel a the tube B, wick C, stem e, and plate f are raised or lowered together.

The wick-tube embraces the wick to a short distance from the upper end of the wick. By having a sliding wick-tube I am enabled to raise the flame of the wick to a greater height within the burner without exposing a larger proportion of wick-surface to the action of the flame. The plate f serves the purpose of an extinguisher when drawn down upon the plate F.

G is a perforated tube, of a diameter equaling that of the block E. It is, at its lower end, fastened to the periphery of the block E, and extends upward, as shown. To the inner side of this perforated tube is secured the rim g of a short tube, H, which surmounts the rim or body of the plate F. The tube H is preferably of smaller diameter than the plate F, and has a connecting step or shoulder, h, that joins it to the rim g, as clearly indicated in Fig. 1. This shoulder h rests on the upper edge of the rim b, or directly on the perforated plate F, if the rim b is omitted. Shortly above the shoulder h the tube H is perforated with holes of considerably larger diameter than the holes of the tube G or rim b.

The upper end of the tube H is closed by a hinged cap, I, which can be swung open by hand or by raising the plate f against it.

J J are wire brackets placed into sockets i i, that are formed by bending and partly cutting the tube G, in manner clearly shown in the drawing. By this construction the brackets are removable and reversible, and yet firmly supported when used.

In use the flame is started by igniting the upper end of the wick and then closing the cap I upon the tube H. The wick-flame burns then in a chamber, H, to which a small proportion of air is admitted through the rim b or plate F, and from which gases can freely escape through the comparatively large holes in the tube H. In other words the flame is reduced to the bare possibility of existence, but not entirely stifled, and is thus utilized as a means of vaporizing all that proportion of

DEFENDANTS' EXHIBIT N

Patent No. 270,587—Vapor Burner—W. Heston—January 16, 1883.

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(No Model.)

W. HESTON.

VAPOR BURNER.

No. 270,587. Patented Jan. 16, 1883.

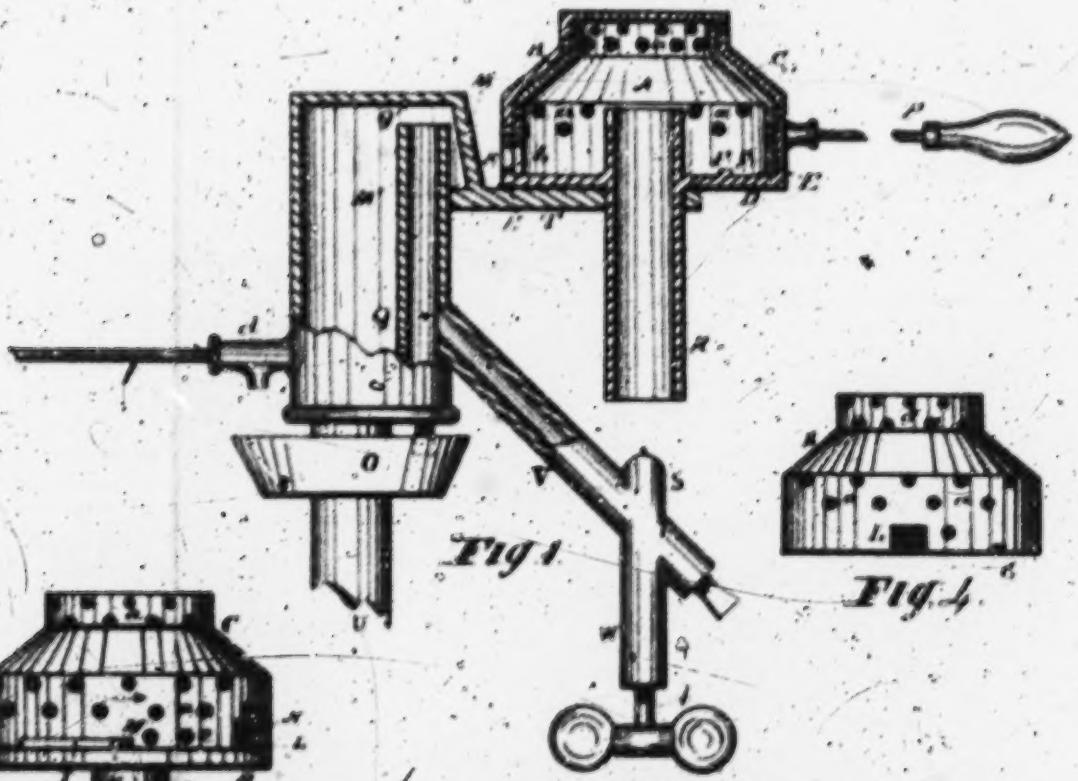


Fig 1

Fig 4

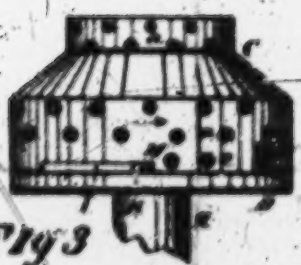


Fig 3

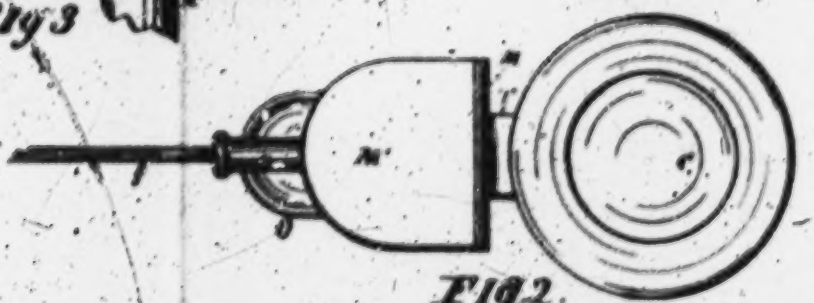


Fig 2

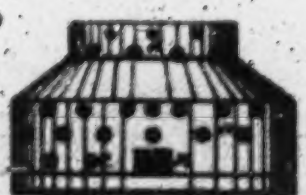


Fig 5

Witnesses,
J. H. Burridge.
F. A. Lovell

Inventor
Wm Heston
Wm H. Burridge
Atty

215

UNITED STATES PATENT OFFICE.

WILLIAM HESTON, OF MOUNT UNION, ASSIGNOR OF ONE-HALF TO JAMES E. INGERSOLL, OF BEDFORD, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 270,587, dated January 16, 1883

Application filed October 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HESTON, of Mount Union, in the county of Stark and State of Ohio, have invented a certain new and Improved Vapor-Burner; and I do hereby declare that the following is a full, clear, and complete description thereof.

This improvement relates to a vapor-burner, the nature of which consists of double perforated caps, one of which is stationary and the other movable for the purpose of regulating the flame-jets, and to cause a small jet to continue burning to avoid the trouble and delay of relighting.

The improvement also relates to the means employed for generating the vapor from the oil for combustion in the dome.

For a more full and complete description of the said improvements reference will be had to the following specification, and to the annexed drawings, making a part of the same, in which—

Figure 1 is a view of a vertical section in part of the vapor-burner; *Fig.* 2, a top view. Figs. 3, 4, and 5 are views of the perforated caps detached.

Like letters of reference refer to like parts in the several views.

The combustion-chamber A, Fig. 1, is inclosed by two perforated caps, B C, of which B is the inside stationary cap and C the outside movable one. The interior cap is adjusted to the base or floor D of the combustion-chamber, so as to fit on the inside of the flange F, and is prevented from turning by means of the lug or pin F, which projects from the base D into a slot, G, in the lower edge of the cap, as shown in Figs. 1 and 4. This pin and slot prevent the cap from turning; but it may be readily removed and replaced, as occasion may require. The exterior cap, C, fits down over the interior one, and closes up the opening in the upper part or top of the interior one. The lower edge of the exterior cap, C, rests upon the flange E of the base D, while the interior cap is on the inside of the flange E, which flange prevents the inside cap from moving laterally, and thereby the exterior cap is also prevented from moving laterally, but is free to turn horizontally, so as to open or close the perforations in the caps, respectively. The exterior cap is permitted to turn only a certain distance sufficient to regulate the gas-jet from the perforations *a*. This is attained by means of lug H, projecting from the upper edge of the flange E into the elongated slot or opening I in the lower edge of the exterior cap. The shoulders at each end of the opening determine the distance of the horizontal rotation of the cap, as lug H forms a stop for the shoulders. When full jet-flames are required the exterior cap is turned in the direction of the arrow, Fig. 3, until the shoulder J is brought in contact with lug H, or nearly so, which will close the openings K and L and open the perforations *a* in the respective caps. The volume of flame-jets may be more or less reduced by turning the exterior cap in a reverse direction of the arrow, which will close up the perforations *a*, as required, for less heat. This closing of the perforations is due to the blank spaces of the exterior cap covering over the perforations of the interior cap. This opening and covering of the perforations in the interior cap causes more or less volume of flame to issue from the combustion-chamber A. On turning the exterior cap so that the shoulder N will be in close proximity to the lug H, the perforations of the interior cap will be closed over by the blank spaces between the perforations of the exterior cap. In this position the openings K and L will coincide with each other and will have a flame-jet issue from the chamber A through them, and impinging on the face M of the generating-chamber M'; but as the volume of flame from these joint openings is much less than from the perforations of the caps there will be less heat imparted to the chamber M'. Hence less gas is generated from the oil therein, but sufficient will be evolved to produce a low constant flame, enough at any time to cause full jets to issue from the perforations on turning the exterior in the direction of the arrow, so as to increase the heat upon the generating-chamber from the openings. In this way, after the first lighting of the burner by means of the oil-cup O, it need not be resorted to, as the burner may be fully inflamed from the result-

ant effect of the jet from the joint openings K L of the caps. When the perforations are in full-open relation with each other, so that the maximum volume of jets is attained, the perforation *c*, Figs. 3 and 5, will then coincide with the opening L in the interior cap, Figs. 1 and 4, to cause a jet to pass from the combustion-chamber through this space, which otherwise would be blank, and to be impinged upon the generating-chamber. It will be noted that the opening L will at all times be in the same position, directly opposite the upper part of the generating-chamber, as seen in Fig. 1.

The turning of the exterior cap is so regulated or determined by the lug H, in connection with the slot I and the shoulders J N, that the cap can only be turned a given distance, and when moved to the position seen in Fig. 3 the perforations *c* are closed and the openings K L made to coincide, so that a light low flame ensues therefrom, and on turning the cap C in the direction of the arrow the openings K L are closed and the perforations opened accordingly.

To the cap C is connected a handle, P, for turning it.

Connected with the base or floor of the chamber A is a conducting-tube, R, which is in open relation with the needle-valve mechanism S at its lower end, the upper end opening into the combustion-chamber, as seen in Fig. 1. The tube R is supported in a bracket, T, attached to the generating-chamber M', Figs. 1 and 2, by which the combustion-chamber is held in position. To the lower end of the generating-chamber is attached a supply-pipe, U, leading to the oil-supply tank. (Not shown, as it may be same as ordinarily used for this purpose.) In the interior of the generating-chamber is a vapor-pipe, Q, closed at the lower end and open at top into the generating-chamber, as seen at Q'. This vapor-pipe forms a part of the said chamber M'.

Extending from the vapor-pipe Q, and in open relation therewith, is a branch pipe, V, which connects with the needle-valve pipe W, in which is fitted the needle-valve, the stem *b* thereof being provided with a handle for operating it in the usual way.

Directly under the generating-chamber and attached to the pipe U is an oil-cup, O, Figs. 1 and 2, into which oil is conveyed from the lower part of the generating-chamber M' by means of the valve-cock *d*, which admits of more or less oil passing from the chamber M' into the cup, as may be required. The supply may be stopped entirely by closing the valve-cock, the stem of which is seen at *f*, Figs. 1 and 2. On the oil being conveyed to the generating-chamber M' and the cup supplied, as before stated, the ignition of the oil in the cup will convey heat to the generating-chamber, causing generation of vapor from the oil, which will pass through the pipes Q V to the needle-valve pipe or chamber, thence through the conductor R into the combustion-chamber, from which chamber it issues through the perforations and openings before set forth. A portion of the flame from the chamber A passes through perforations or openings adjoining the upper part of the generating-chamber, thereby supplying the required heat for the constant generation of the gas or vapor so long as the supply of oil is continued. The upper end of the pipe Q is in close proximity, at Q', to the upper end of the generating-chamber M', by which regurgitation of the oil through the pipes on igniting the burner is arrested, as the rapid generation of gaseous vapor above the oil in the chamber will have sufficient pressure above the oil to resist the ebullition of the oil engendered by the heat from the cup O when ignited, and thereby preventing its passage through the pipes to the combustion-chamber.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In vapor-burners, the two perforated caps B C, arranged one within the other, the interior one being stationary and the exterior one movable therein, and provided with openings K L, slot I, and lug H, in combination with the pipe R and needle-valve mechanism, substantially as described, and for the purpose set forth.

2. In vapor-burners, an improvement consisting of double perforated caps B C, provided with openings K L, the interior cap being stationary and adjusted to the floor of the combustion-chamber within the flange E, and the exterior cap, C, inclosing the said cap E and turning upon the same, in combination with the pipe R, generating-chamber, and needle-valve mechanism, substantially in the manner as described, and for the purpose specified.

3. In vapor-burners, the combustion-chamber having a stationary and movable cap, slot I, and pin H, with a pipe extending from the needle-valve mechanism into the interior of said chamber, in combination with the bracket T, generating-chamber, openings K L, and pipes Q V, arranged substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM HESTON.

Witnesses:
W. H. BURRIDGE,
J. H. BURRIDGE.

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(No Model.)

I. E. BLAKE & H. RAUCHFUSS.

HYDROCARBON BURNER.

No. 453,335. Patented June 2, 1891.

Fig. 2

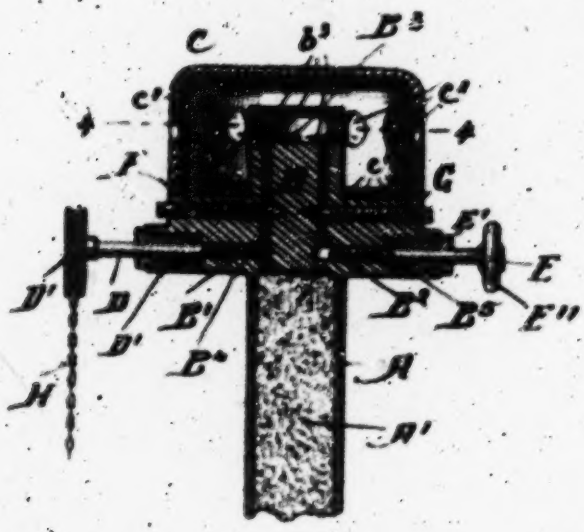


Fig. 1

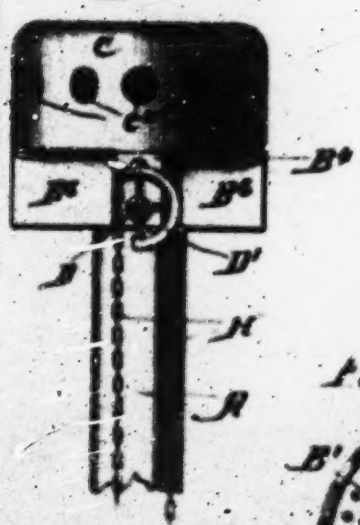


Fig. 4

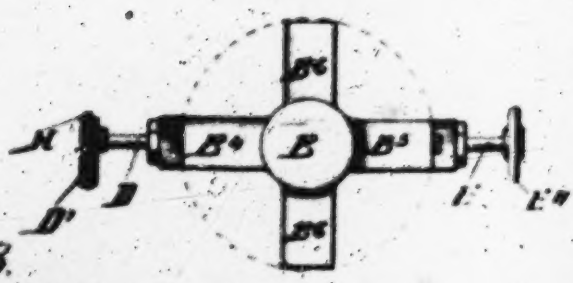
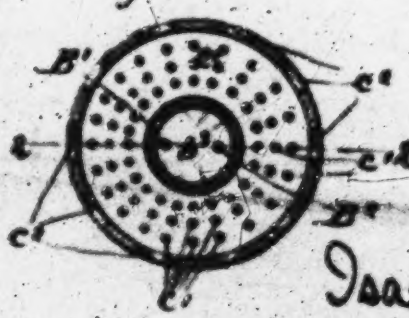


Fig. 3



Witnesses:
Jas. Elliott
Edwin P. Hodgman

Inventor
Isaac E. Blake
Herman Rauchfuss
By Burton and Burton
Attorneys

UNITED STATES PATENT OFFICE.

ISAAC E. BLAKE AND HERMAN RAUCHFUSS, OF DENVER, COLORADO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 453,335, dated June 2, 1891.

Application filed April 17, 1890. Serial No. 348,300. (No model.)

To all whom it may concern:

Be it known that we, ISAAC E. BLAKE and HERMAN RAUCHFUSS, citizens of the United States, residing at Denver, county of Arapahoe, and State of Colorado, have invented certain new and useful Improvements in Hydrocarbon Illuminating Burners, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

Figure 1 is a side elevation of our improved burner. Fig. 2 is a vertical axial section through the line 2 2 on Fig. 3, said Fig. 3 being a plan with the shield removed. Fig. 4 is a section at 4 4 on Fig. 1.

This application is for an invention related to another invention for which our joint application, Serial No. 348,301, is filed simultaneously herewith, and we do not design in this application to claim specifically anything which is shown in the other application above named.

This invention is designed to facilitate the use of hydrocarbon oils for illumination, and is adapted for use with the lighter and more volatile oils—such as naphtha or gasoline—which vaporize at a moderate heat.

It consists in improved devices whereby a minimum flame is maintained and protected from extinguishment and converted into a maximum flame when desired. The devices employed are designed also to make the maximum flame consist of radiating jets rather than a continuous integral flame.

In the drawings, A is the supply-tube and vaporizing-chamber, which is filled with any suitable absorbent and porous substance A', which checks the flow of the fluid to the burner and retains the heat after the burner is lighted, causing the fluid which is conducted into it to be vaporized in its pores. The tube or stem A is cast in one piece with or brazed at the upper end to the burner-tip B. Two ducts B' and B² extend through the burner-tip from the chamber in the stem A to the spreading-chamber B³, formed in the upper end of the burner-tip B. This spreading-chamber might properly also be called a "vaporizing-chamber," since before the burner becomes hot enough to cause the formation of vapor in the stem A the liquid will be vaporized in this spreading-chamber B³. Fine orifices b^2 lead from the chamber B³ through its wall outwardly, said orifices being arranged in a horizontal plane discharging radially from the chamber, and through them the vapor is discharged in jets and is ignited on the outer side of the chamber. The tip B is formed with four radial arms B^4 B^5 B^6 B^6, extending horizontally from its base, and we provide the shield C, so named from its function, as hereinafter explained, which is a hollow cylinder having an opening through its base large enough to allow it to be passed down over the upper end of the burner-tip, and which rests upon the four radial arms B^4 B^5 B^6 B^6. The base C' of the shield C is perforated, said perforations c' being distributed over its entire surface and designed to admit air freely into it from below. Its cylindrical wall is pierced by apertures c^2, equal in number and in line radially with the orifices b^2, respectively leading from the spreading-chamber B^3.

Through the arms B^4 and B^5 holes are drilled into the ducts B' and B², respectively, and screw-valves D and E, suitably guarded about their stems with stuffing-boxes D' and E', are provided, entering through said holes and seating across said ducts B' and B², respectively. Directly above each of these valves simple screw-valves F and G are inserted through the arms D^4 and D^5, respectively, and seated in and adapted to close the ducts B' and B², respectively, above the seats therein of the valves D and E, respectively. These latter valves F and G are preferably made with slender tapering points, and their seats are of course similarly formed, whereby they are adapted to be very accurately adjusted. The valves D and E may not be so slender, but may cease more abruptly. The valve D we prefer to provide with a sheave-handle D', to which a chain H may be connected for convenience in operating it. The valve E may have no handle at all, or may be provided with a handle E'', as shown; but the valves F and G are preferably without handles, but may be slotted at the exposed ends to be operated by a screw-driver. These latter valves are designed to be so tightly fitted in their threads as to require no stuffing-boxes, and to be adjusted not too easily even by means of a screw-driver, and incapable of adjustment by the fingers without a tool.

This burner is designed to be used in the following manner: The valve E being closed and the valves F and D being open and the valve G either open or closed, it being at this stage a matter of indifference whether it is open or closed, the fluid admitted through the pipe A and contained in the porous material A′ flows up through the duct B′, and, overflowing in the chamber B² and flowing out through the orifices b^2, will be ignited upon the outside of the burner-tip. It will be understood that for this purpose the shield C may be temporarily removed. The valve D may now be closed, or so nearly closed as to admit a very slight quantity of oil past it, the oil which has overflowed and such additional quantity, if any, as may be supplied past the valve D burning freely until the entire burner-tip B and the tube A, connected to it, are sufficiently heated to cause the fluid contained in the porous contents A′ of the tube A to be vaporized therein, so that the discharge from the orifices b^2 is no longer oil, but vapor. It will be understood that if the valve D has been closed entirely after the first discharge of oil past it, as described, it must be opened again before the oil so discharged is entirely burned up, in order that the vapor or vaporized oil in the tube A may be admitted to the burner-tip to maintain the flame. The valve D will now be opened wide, and the valve F will be screwed in until the discharge of vapor past it is limited to such amount as can be continuously generated in the chamber A. This amount and the consequent adjustment of the valve F will be determined by the judgment of an expert or by sufficient experiment to ascertain it reliably, and the valve F, having been once set at this position, need never be changed, except when a different grade of oil is to be used, which may change the conditions. The valve D being now closed entirely, and the valve E opened wide, the valve G will be adjusted to such position that it will admit past it only the least quantity of vapor, which will maintain the temperature of the burner at the vaporizing-point. This valve, being thus adjusted, will need no change unless a different character of oil is to be used, which may require a greater volume to maintain the same temperature, or which vaporizes at a different temperature. It will be seen that when the valves F and G are thus adjusted the flame may be increased from the minimum which can be maintained to the maximum that the burner is capable of supplying reliably by opening the valve D to any desired extent, and that, once lighted and properly adjusted, the flame will never be extinguished entirely, and the burner may therefore be operated with as great convenience as a burner fed by a gas-supply and provided with automatic lighting attachments, so that the process of first flooding the burner with oil and watching it until it begins to vaporize and then with care requiring an expert adjusting it to the proper point each time it is used is dispensed with. If at any time it is desired to extinguish the burner entirely, as when the light is not to be required for a long time, as for several days or weeks, the valve E will be closed as well as the valve D; but in the ordinary intervals of use from night to night the valve E will be left open and the flame maintained at the minimum, controlled by the valve G, as described.

It will be apparent that the slight flame formed when the valve D is closed and the vapor is admitted only past the minimum valve G would be liable to be extinguished by drafts of air, and also that the large flame might be rendered unsteady and might be extinguished at some of the orifices momentarily by air-blasts accidentally directed upon it if no protection were afforded for the flame. To afford such protection is the purpose of the shield C. This shield has the bottom C′ perforated, as already described, the intention being to admit an abundant supply of air to the flame, but to so thoroughly break it up that it shall be distributed evenly and not at any time reduced to a blast at any one point. The shield entirely encircles the burner-tip and is closed at the top, and has the apertures c^2, which are radially in line with the apertures b^2 in the burner-tip B. The apertures c^2, however, are very much larger than the orifices b^2, the latter being from one one-hundredth to one-fiftieth of an inch—that is, barely large enough to admit a fine needle—while the former—the apertures c^2—are from three-sixteenths to three-eighths of an inch in diameter. The jets emitted from the orifices b^2 are directed toward the apertures c^2, and when the supply-valve is opened to such an extent as to produce actual illumination from the burner these jets shoot out through the apertures c^2. When the burner is turned down—that is, when the valve D is closed, or nearly so—and the quantity of vapor admitted is that which is permitted by the valve G, the jets barely protrude from the orifices b^2, or at least do not extend far enough to be visible outside the shield C. In practice a bare blue point of flame is visible at the orifices b^2 when the supply of vapor is at the minimum as controlled by the valve G.

We claim—

1. In a vapor-burner, in combination with the fluid-supply pipe and the burner-tip and a duct communicating from the supply-pipe to the tip, and the valve controlling such duct, the tip having peripheral jet-orifices in horizontal plane, through which the vapor is emitted radially, and a shield encircling and covering such tip and having peripheral openings in a horizontal plane radially in line with the jet-orifices, respectively, and through which the flame can extend when the controlling-valve is sufficiently opened, substantially as set forth.

2. In a hydrocarbon-burner, in combination with the supply-pipe and the burner-tip,

ducts which communicate with the supply and the tip, a limiting-valve seating each of said ducts, one of such valves being adjusted to the minimum and the other to the maximum of the desired supply, the third valve controlling the duct which has the minimum limiting-valve, the burner-tip having peripheral jet-orifices in horizontal plane, through which the vapor is emitted radially, and a shield C, encircling and covering such tip and having in a horizontal plane peripheral flame-orifices c^2, which are radially in line with the jet-orifices, respectively, whereby the jets of flame emitted from the jet-orifices are caused to extend out separately and directly in a horizontal plane through said flame-orifices, substantially as set forth.

In a vapor-burner, in combination with a burner-tip having jet-orifices located in a horizontal plane and discharging radially, a shield encircling and covering such tip and inclosing a chamber between the tip and the shield, the latter having peripheral apertures in a horizontal plane in line radially with the jet-orifices, respectively, and larger than the latter, whereby the flame formed at the jet-orifices is shielded from exterior currents of air until it is emitted through the shield-apertures, substantially as set forth.

In testimony whereof we have hereunto set our hands, in the presence of two witnesses, at Denver, Colorado, this 11th day of April, 1890.

ISAAC E. BLAKE.
HERMAN RAUCHFUSS.

Witnesses:
C. B. COWELL,
M. MCMULLIN.

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DEFENDANTS' EXHIBIT N

Patent No. 755,864—Oil Stove—E. E. Flora—March 29, 1904.

231

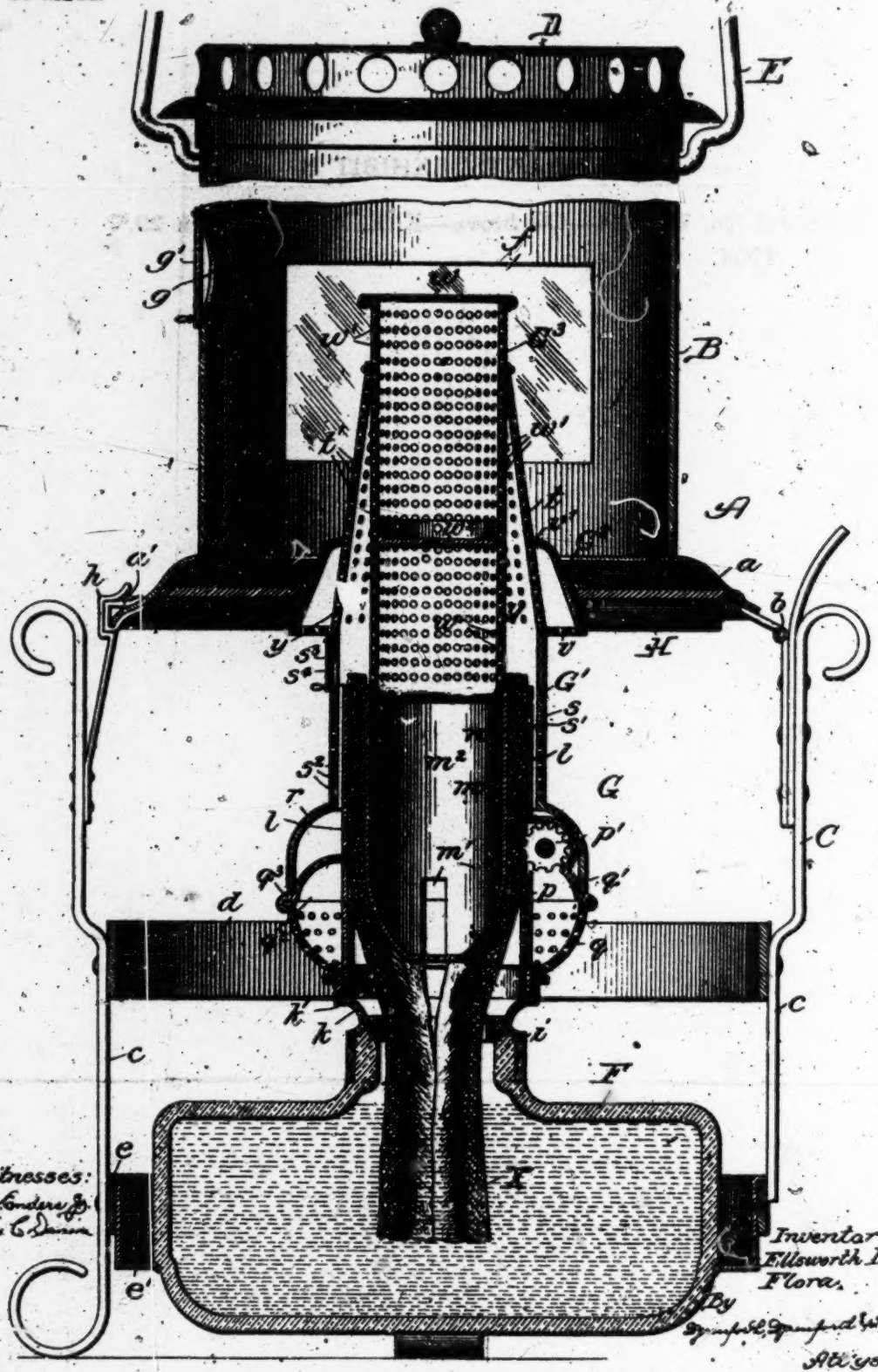
No. 755,864. PATENTED MAR. 29, 1904.

E. E. FLORA.

OIL STOVE.

APPLICATION FILED OCT. 9, 1903.

NO MODEL.



Witnesses:
Jno. Enders Jr.
E. C. Dawson

Inventor:
Ellsworth E. Flora.
By Dyrenforth Dyrenforth & Co.
Attys.

UNITED STATES PATENT OFFICE.

ELLSWORTH E. FLORA, OF CHICAGO, ILLINOIS, ASSIGNOR TO THOMAS J. LOVETT, OF CHICAGO, ILLINOIS.

OIL-STOVE.

SPECIFICATION forming part of Letters Patent No. 755,864, dated March 29, 1904.

Application filed October 9, 1902. Serial No. 126,468. (No model.)

To all whom it may concern:

Be it known that I, ELLSWORTH E. FLORA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Oil-Stoves, of which the following is a specification.

This invention relates to improvements in stoves adapted for burning hydrocarbon oil.

My object is to provide an oil-stove to be employed more especially as a heater and of a particularly simple, compact, and safe construction for household use and capable of developing and radiating a large amount of heat at a minimum expense of oil.

My invention lies more especially in the general construction of the burner, as well as in details of construction thereof, as hereinafter fully described and claimed.

The drawing is a broken sectional view of a stove constructed with my improvements, the upper end portion of the stove being shown in elevation.

The burner is particularly well adapted for use in small portable stoves; but the burner may be of any desired size, and, if desired, a single stove may be provided with a plurality of the wick-fed burners arranged in a row or in a cluster of any suitable form.

Referring to the construction shown in the drawing, A is a stove having a combustion-chamber formed with the cylindrical casing B. The casing is provided with a base-flange *a*, hinged at *b* to a frame C, formed of vertical legs *c*, braced with upper and lower rings *d e*, respectively. At the top of the cylinder or chamber B is a cover D, provided with vent-holes for the products of combustion, and pivotally connected with opposite sides of the casing beneath the cover D is a bail E, affording a handle by means of which the entire structure may be carried from place to place. In the sides of the cylinder B are one or more openings *f*, closed with mica or other transparent material, and in the position shown is an opening *g*, closed by a sliding or swinging door *g'*. At the side opposite the hinge *b* the base *a* is formed with a catch *a'*, adapted to engage a spring-latch *h* on the frame C to lock the parts together when closed, as shown.

F is a font or oil-reservoir provided with the usual threaded burner-engaging collar *i*.

G is a wick-fed hydrocarbon-oil burner constructed as follows: The base of the burner is a flanged ring *k*, having an internally-threaded upper end portion presenting a shoulder *k'* and a lower threaded end adapted to screw into the collar *i*. An outer wick-tube *l* is threaded at its lower end to screw into the flanged base *k* against the shoulder *k'*. An inner wick-tube *m*, closed at the base, extends concentrically with the other tube *l*, forming with the latter an annular passage or chamber *n* for the wick X. Sliding in the chamber *n* adjacent to the wall *l* is a wick raising and lowering sleeve *p*, actuated from the usual wick raising and lowering pinion *p'* in a common manner. Rigidly secured to the lower end portion of the tube *l* is a perforate cup-shaped base *q*, to which is rigidly secured an imperforate dome-shaped ring *q'*, which extends to the tube *l* and also houses the pinion *p'*, as shown. The parts *l q q'* form a lower draft-chamber q^2, which communicates with the interior of the tube *m* by means of one or more draft-passages *m'*, which are straddled by the wick X in the usual way. The imperforate dome-shaped ring *q'* is shaped to form the annular shoulder q^3. G' is an outer burner-tube consisting of an expanded base portion *r*, a cylindrical portion *s*, and a tapering portion *t*. The expanded base portion *r* fits over the dome-shaped ring portion *q'* and rests tightly but removably against the shoulder q^3. The cylindrical portion *s* is of somewhat greater diameter than the wick-tube *l*, leaving a narrow annular intervening draft-passage *s'*, fed through a series of perforations s^2 in the lower end of the cylindrical portion *s*, beneath the top of the tube *l*. Adjacent to the tops of the tubes *m l* is an igniting-opening s^3 in the cylinder portion *s*, which opening is closed by a door or shutter s^4. The tapering portion *t* is provided throughout its length with numerous perforations *t'*. Rigidly secured to the outer side of the burner-

tube G′ in the position shown is a ring or hood G^2 of frusto-conical form, having a perforate base *v* and presenting a narrow annular draft-opening *v′* at its upper end around the perforate tapering portion *t*. On the outer side of the hood G^2 is an annular socket v^2, holding a ring or diaphragm H, which at its outer edge fits closely against the inner surface of the base-ring *a* of the casing B. When the upper part of the stove is swung down upon the hinge *b* to close it, as shown, the diaphragm H closes communication between the combustion-chamber and the under side of the diaphragm except through the burner-passages. Mounted in the tube G′ is an inner burner-tube G^3 of cylindrical form. It is open at its lower end and there adapted to fit closely into the top of the central draft-tube *m*, and it is closed at the top by an imperforate cap *w*. The cylindrical wall of the tube G^3 is provided throughout with numerous perforations *w′*. In the perforate tube G^3 in the position shown is an imperforate disk or diaphragm w^2. The inner burner-tube G^3 fits tightly through the top of the outer burner-tube G′, the tubes being fastened together.

In practice the parts should be so arranged with relation to each other that the disk or diaphragm w^2 is in the horizontal plane of the outer annular draft-opening *v′*. The burner-tubes G′ G^3 form between them an annular air and gas mixing chamber *y*. To produce the best results, the font F should be filled with an ordinary good grade of kerosene-oil, such as is usually provided for kerosene-burning lamps. The oil rises in the wick X by capillary attraction in the usual way. To start the stove, the shutter s^4 is opened and a lighted match is passed through the opening s^3 to ignite the top of the wick, the wick being lowered to the position shown for this purpose. Air to supply combustion of the oil at the top of the wick enters through the openings s^2 and passage *s′* at the outer side and through the openings in the base *q* the passage or passages *m′* and central draft-passage m^2, formed by the tube *m*, the air passing to the wick and mixing-chamber through the openings *w′* at the lower end of the tube G^3. The products of combustion from the oil, burning at the top of the wick, quickly raises the temperature of the inner burner-tube g^3 and outer burner-tube G′, the heat being conducted by these tubes downward to the upper end portions of the inner and outer wick-tubes *m l*. When the parts named have become heated to a sufficiently high temperature, which in practice takes less than a minute's time, the wick may be lowered to extinguish the flame or the flame may be otherwise quenched. The wick is then raised until its top is more or less nearly adjacent to a plane corresponding with the plane of the part *v*. The heat stored in the inner and outer burner-tubes gasifies the oil rising into the upper part of the wick, and the air entering through the draft-openings s^2 and lower openings *w′* mixes with the gas in the mixing-chamber. This mixture rising and escaping through the burner-openings *t′* is then ignited by means of a match inserted through the opening *g*, the latter being closed again by the door or shutter *g′*.

Air to mix with the gas and generate the proper burning mixture in the mixing chamber *y* enters, as before stated, from the outer draft-openings s^2 and inner draft-tube m^2 and escapes for the most part through the burner-openings *t′*. Additional air to supply combustion enters through the perforate part *v*, passing through the adjacent perforations *t′* into the mixing-chamber and a part passing upward through the annular draft-opening *v′* to direct the flame upward. By reason of the fact that the mixing-chamber *y* tapers to the top a large portion of the burning mixture passes through the perforations of the inner tube G^3 into the latter and escapes through the upper openings *w′* near the cap *w*, being there ignited.

From the foregoing description it will be understood that after the flame at the wick has preliminarily heated the burner-tubes and has then been extinguished, as described, all combustion of the burning mixture takes place at the burner-openings, which burner-openings are the perforations *t′* above the draft-opening *v′* and the perforations *w′* above the upper end of the outer draft-tube G′. As the wick need burn but the fraction of a minute when the stove is first started, a wick once provided may last indefinitely. The construction shown and described is adapted to insure the perfect intermixture of air and gas in desired quantities, the supply of gas of course being regulated by the height to which the wick is raised above the tops of the wick-tubes *l m*. Thus an annular flame of a width equaling the distance from the draft-opening *v′* to the cap *w* may be produced, the flame being blue in color, indicating substantial perfect combustion. The draft from the opening *v′* directs the flame upward, preventing its playing directly against the cylindrical wall B, and the products of combustion escape through the outlets in the top D. The stove constructed as described has comparatively great heating capacity.

As before stated, the stove structure may be adapted to hold a plurality of burners, which may be provided with wicks fed from individual fonts F, or all the wicks may be fed from a single font.

By swinging the upper part of the stove backward upon the hinge *b* access may be had to the burner-tubes when desired, and the burner-tube G′, with the parts G^2, H, and G^3, may be lifted off of the lower part of the

burner (the separation taking place at the shoulder g^3) whenever it is desired to have access to the wick-tubes, &c.

In the construction shown the font F rests in a socket formed by a socket-ring e'. Whenever it is desired to fill the font with oil, it and all the parts carried thereby may be lifted out of the frame, when the stove is opened upon the hinge b, as described.

It has been found in practice that heat of much greater intensity and volume may be obtained from a burner such as I provide than it is possible to obtain from a burner in which the oil is fed by and ignited at a wick. By employing a wick I obtain the advantages of a regular and readily-controllable supply of the oil and render the stove as free from any danger of explosion as any well-constructed kerosene-lamp. When the burner is in operation, the heat-generating portion thereof is altogether at the burner-openings above the draft-opening v', which is far enough above the wick to prevent the heat from charring it, but not so far as to prevent heat from being conducted downward by the burner-tubes to gasify the oil at the wick as fast as desired. As oil is burned at the wick only for a fraction of a minute when the stove is started, the wick is not materially affected thereby, and as there is practically no material charring of the wick at any time it will not become clogged or require trimming except at very long intervals at the worst.

Modifications of details of construction within the spirit of my invention may be made. Hence no undue limitation should be placed upon the invention by reason of the foregoing detailed description.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an oil-burning heater, the combination with a wick and wick-tube, of inner and outer perforated heat-conducting burner-tubes closed at their upper ends and forming between them an air and gas mixing chamber into the lower end of which the wick projects above the wick-tube.

2. In an oil-stove, the combination of a wick-tube presenting a central draft-passage, a wick in the wick-tube, inner and outer perforated heat-conducting burner-tubes closed at their upper ends and extending above the wick-tube, forming an air and gas mixing chamber into the lower end of which the wick extends, and a stove-casing inclosing the heat-generating part of the burner, substantially as set forth.

3. In an oil-burner, the combination with a wick and with a wick-tube presenting a central draft-passage, of a perforated outer heat-conducting burner-tube around the wick-tube, a perforated inner heat-conducting burner-tube extending from said central draft-passage beyond the upper end of said outer burner-tube, the inner and outer burner-tubes closed at their upper ends and forming between them a gradually-contracted air and gas mixing chamber, a hood about the outer burner-tube forming an outer contracted draft-passage between the upper and lower ends of said mixing-chamber and a diaphragm in the inner burner-tube in approximately the plane of the top of said hood, substantially as set forth.

4. In an oil-burner, the combination with a wick, and with a wick-tube presenting a central draft-passage, of a perforated outer heat-conducting burner-tube around the wick-tube, a perforated inner heat-conducting burner-tube extending from said central draft-passage beyond the upper end of said outer burner-tube, the inner and outer burner-tubes closed at their upper ends and forming between them an air and gas mixing chamber into the lower end of which the wick extends, and a diaphragm in the inner burner-tube between the lower and upper ends of the mixing-chamber.

5. In an oil-burner, the combination with a wick, and with a wick-tube presenting a central draft-passage, of a perforated outer heat-conducting burner-tube forming a draft-passage around the wick-tube, and a hood about the outer burner-tube forming an outer draft-passage, the perforated inner heat-conducting burner-tube extending from said central draft-passage beyond the upper end of said outer burner-tube, and the inner and outer perforated burner-tubes closed at their upper ends and forming between them an air and gas mixing chamber into the lower end of which the wick extends.

6. In an oil-burner, the combination with a wick, and with a wick-tube presenting a central draft-passage, of a perforated outer heat-conducting burner-tube around the wick-tube, a perforated inner heat-conducting burner-tube closed at the top and extending from said central draft-passage beyond the upper end of said outer burner-tube, the inner and outer perforated burner-tubes closed at their upper ends and forming between them an air and gas mixing chamber, a hood about the outer burner-tube forming an outer contracted draft-passage between the upper and lower ends of said mixing-chamber and a diaphragm in the inner burner-tube in approximately the plane of the top of said hood, substantially as set forth.

7. In an oil-burner, the combination with a wick, and with a wick-tube presenting a central draft-passage, of a perforated outer heat-conducting burner-tube around the wick-tube, a perforated inner heat-conducting burner-tube extending from said central draft-passage beyond the upper end of said outer burner-tube, the inner and outer perforated burner-tubes forming between them a gradually-contracted air and gas mixing chamber, a hood about the outer burner-tube forming an outer contracted draft-passage between the upper and lower ends of said mixing-chamber, and a diaphragm in the inner burner-tube in ap-

proximately the plane of the top of said hood, substantially as set forth.

8. In an oil-burner, the combination with a wick and wick-tube, of inner and outer perforated heat-conducting burner-tubes closed at their upper ends and forming between them an air and gas mixing chamber into which the wick projects above the wick-tube, the wall of the mixing-chamber at one side having an igniting-opening, and a door for said igniting-opening, substantially as described.

9. In an oil-stove, the combination of a frame, an oil-font in the base of the frame, a burner upon the said font having a wick-tube presenting a central draft-passage, inner and outer perforated heat-conducting burner-tubes closed at their upper ends and forming between them an air and gas mixing chamber into which the wick projects above the wick-tube, a stove-casing upon the frame surrounding the heat-generating part of the burner, and a diaphragm at the lower end of said casing presenting a narrow draft-opening around said outer burner-tube between the upper and lower ends of said mixing-chamber, substantially as set forth.

ELLSWORTH E. FLORA.

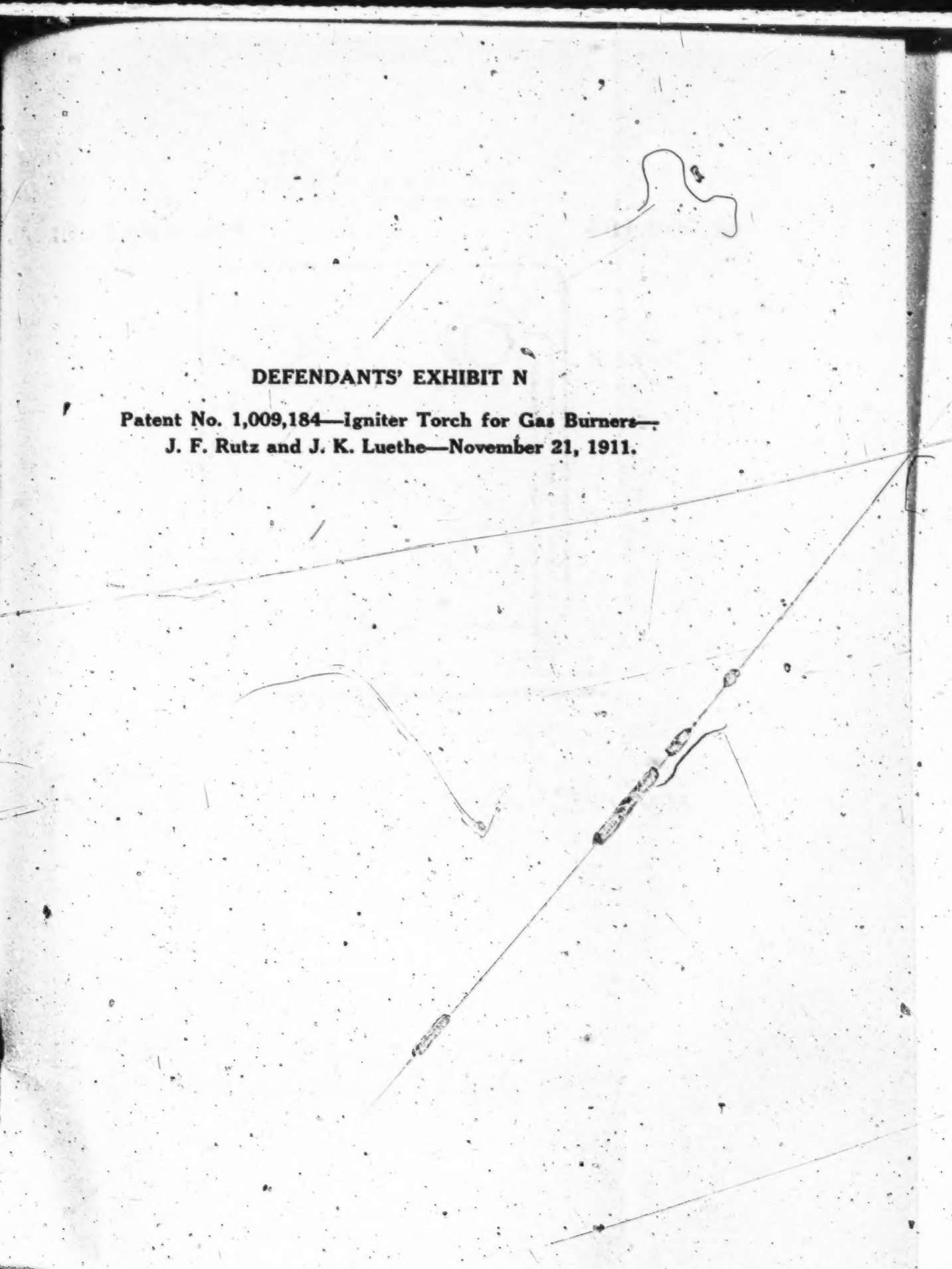
In presence of—

ALBERT D. BACCI,

J. W. DYRENFORTH.

DEFENDANTS' EXHIBIT N

**Patent No. 1,009,184—Igniter Torch for Gas Burners—
J. F. Rutz and J. K. Luethe—November 21, 1911.**



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J. F. RUTZ & J. K. LUETHE.

IGNITER TORCH FOR GAS BURNERS.

APPLICATION FILED MAY 29, 1911.

1,009,184.

Patented Nov. 21, 1911.

Fig. 1.

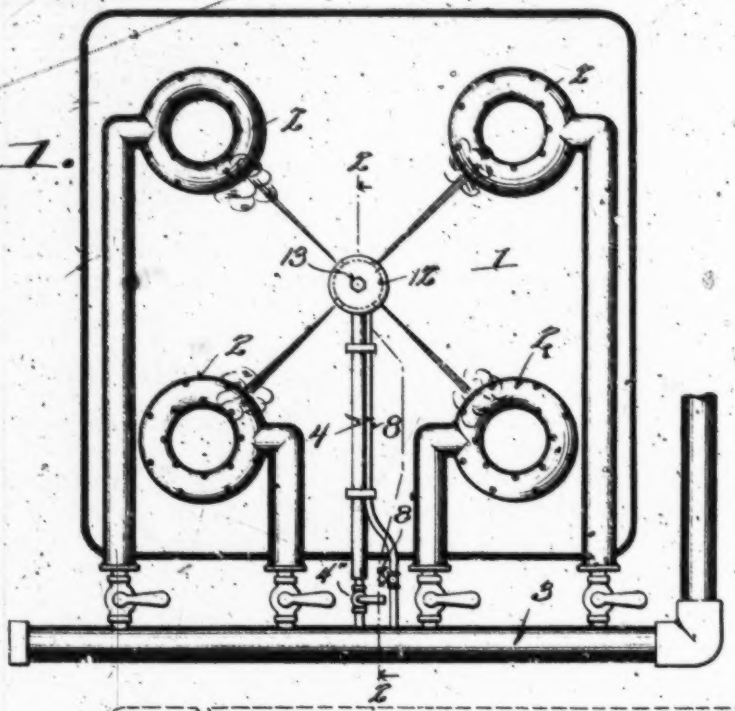
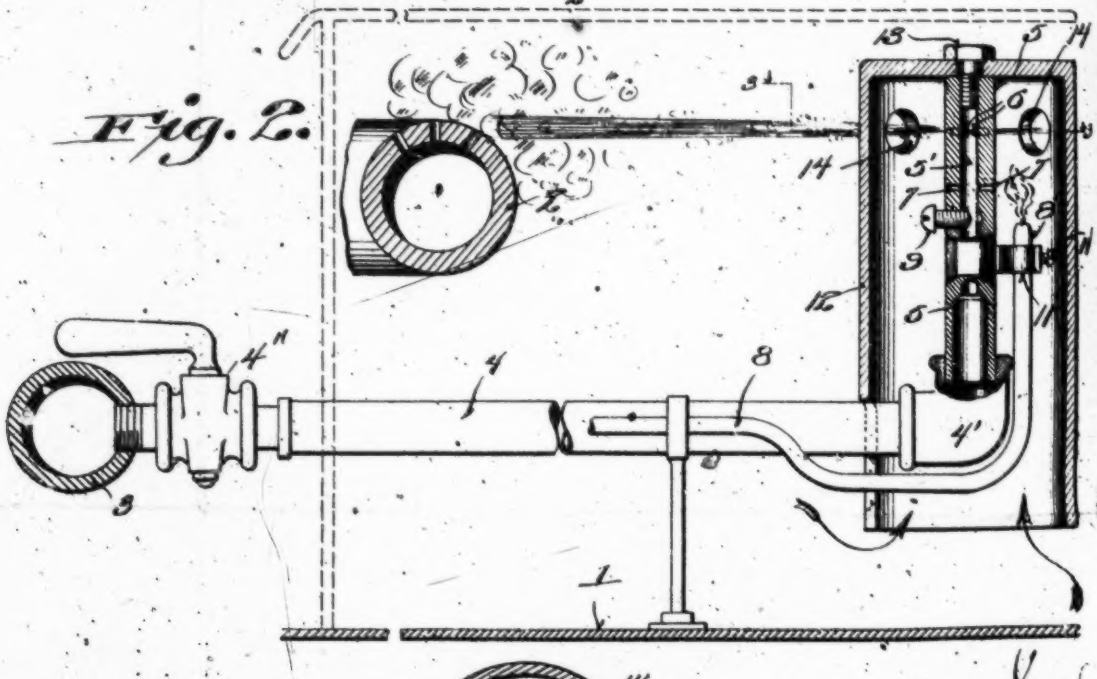


Fig. 2.



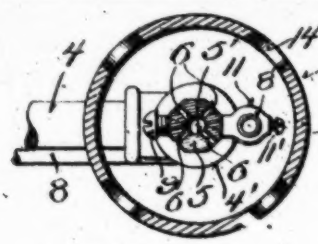


Fig. 3.

Witnesses:
Clarence Young.
May Downey.

Inventors:
Curtis F. Rutz.
Curtis K. Luethe.
by Clapham & Young
Attorneys.

UNITED STATES PATENT OFFICE.

JULIUS F. RUTZ AND JULIUS K. LUETHE, OF MILWAUKEE, WISCONSIN.

IGNITER-TORCH FOR GAS-BURNERS.

1,009,184. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed May 29, 1911. Serial No. 630,113. REISSUED

To all whom it may concern:

Be it known that we, JULIUS F. RUTZ and JULIUS K. LUETHE, both citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, post-office address 812 Brennan street, have invented certain new and useful Improvements in Igniter-Torches for Gas-Burners; and we do hereby declare that the following is a full, clear, and exact description thereof.

The primary object of our invention is to provide a simple, economical and effective igniter torch for gas burners.

Specific objects are to provide a single torch about which a series of valve-controlled burners are grouped within the zone and upon a plane common to individual jet flames that are discharged simultaneously from the torch; to provide a torch head incased within an apertured bell, the apertures being alined with corresponding restricted gas-supply apertures in the torch head; to provide a constant pilot light within the bell whereby the various torch head gas-discharge apertures are simultaneously ignited, the bell forming an air shield for the pilot light whereby cross-currents of air due to exterior disturbances will not snuff out said pilot light, and to provide means whereby the air for the supply of oxygen to the torch flames and pilot light is received from a lower strata than that which supplies the burners, it being well known that ignited burners will consume practically all of the oxygen in the air thereabout and thus reduce the efficiency of a centrally located constant flame.

With the above objects in view our invention consists in what is herein shown, described and claimed.

In the drawings Figure 1 represents a plan view of a gas stove provided with a torch embodying the features of our invention; Fig. 2 an enlarged partially sectional elevation of the torch and its connection, the torch being shown located within a stove which is indicated in dotted lines and having the bottom compartment in full lines and in sections, there being a cross section of a portion of a burner located upon its proper plane relative to the igniter torch. The section of the igniter torch being indicated by line 2—2 of Fig. 1. Fig. 3, a detail sectional plan view of the torch, the section being indicated by line 3—3 of Fig. 2.

Referring by characters to the drawings, 1 represents the bottom of the burner compartment of a stove, the front wall and skeleton top grid of which stove is illustrated in dotted lines. The stove is provided with a series of burners 2 under suitable valve-control and supplied with gas from a main pipe 3 in the ordinary manner. The branch pipe 4 having a valve 4″ is connected to the main pipe 3, said branch pipe being extended into the burner compartment, where it terminates approximately at the center of the same and about which point the burners 2 are conveniently grouped. Coupled to the branch-pipe 4 by an elbow 4′ is a vertically disposed torch-head 5, which torch-head is provided with a longitudinal channel 5′ and terminates upon a plane slightly below the top grid. The torch-head is also provided with a radially disposed gas-discharge aperture 6 for each burner, the apertures being disposed upon approximately the same horizontal plane as the burners whereby the latter are each within the zone of an individual jet flame that is emitted from the gas-discharge apertures of said torch-head when a supply of gas is admitted thereto.

The torch-head has one or more leak apertures 7 below the gas discharge aperture 6, the leak apertures being staggered in their horizontal plane relative to the plane of the gas-discharge apertures whereby the latter are readily ignited, it being understood that gas from the leak-apertures is ignited by a constant burning torch-nozzle 8, the mouth of which is in juxtaposition thereto but upon a lower plane.

The supply of gas to the various torch-head apertures is regulated by a valve-plug 9 that is in threaded union with an opening which intersects the torch-head channel 5′, the plug being below the discharge and leak apertures respectively and is adjusted to effect the desired control of gas thereto. The torch-nozzle 8 is formed from a small tube or pipe that communicates with the main supply-pipe 3 and adjacent to its junction therewith, is equipped with a cut-off valve 8′, which, under ordinary conditions, is open, whereby gas is supplied in small quantities to the constant pilot flame. The end of the torch-nozzle is made fast to the

torch-head by its engagement with an apertured clip 11 and should it be desired to adjust the mouth of said nozzle relative to the leak apertures said adjustment can be effected by springing the pipe 8 up or down so as to change the position of the mouth of the same relative to the leak-aperture and thereafter the said pipe is secured within the clip by a set-screw 11' that is in threaded engagement with the clip.

The torch-head 5 and pilot-light nozzle 8' are incased in a bell 12, the top of which is secured to the upper end of said torch-head by a cap-screw 13 that is in threaded engagement with the torch-head channel 5' whereby the same is closed. The bell 12 is provided with a series of vent-holes 14, there being one for each gas-discharge aperture. These vent-holes are of considerably larger area than the discharge apertures and are in radial alinement therewith whereby flames emitted from said apertures are directed upon the various burners to cause ignition of the latter when their valve-controlled gas pipes are opened.

It is apparent from the foregoing description that in the operation of the torch the valve 8' of the pilot-light is normally open, whereby a small flame is constantly maintained within the bell and, owing to its inclosed position, liability of the same to be inadvertently blown out is practically eliminated. When it is desired to ignite one or all of the burners grouped about the torch the supply of gas thereto is admitted by operating their individual cocks and thereafter the valve 4'' which controls the gas-supply pipe 4 leading to the torch-head is opened. Gas will then pass out through the discharge aperture 6 and also the leak aperture 7, being slightly pocketed or confined within the top of the bell and simultaneously the torch nozzle 8' will ignite this supply of confined gas, causing a slight explosion which, in turn, will ignite the gas from the discharge apertures 6 and the flame from each of said apertures will be flashed through the vent-holes of the bell and directed upon the various burners whereby they, in turn, will be ignited. It is apparent that should only one of the burners be open to the supply of gas no effect upon the remaining burners will be had. Attention is also called to the fact that the air for the supply of oxygen to the torch is drawn in through the space between the mouth of the bell and the bottom 1, the intake of air being thus upon a considerably lower plane than the burners, the supply of sufficient oxygen for the torch is insured and furthermore the bottom of the bell being in juxtaposition to the bottom plate 1 said bell will effectually shield the pilot-light from the disturbing influence of cross-currents of air. It will be observed that the horizontally alined vent-holes of the bell and discharge apertures 6 are so arranged for the purpose of discharging the torch flame at the most convenient point for igniting the burner.

We claim:

1. In a gas stove provided with a group of burners; the combination of an igniter torch located approximately centrally of the group, the torch comprising a vertically disposed head having a plurality of radially disposed apertures, each aperture being alined with a burner, a vertically disposed bell having a closed top incasing the head, the bell being provided with radially disposed vent holes, each being in register with a head aperture, a pilot nozzle extending into the bell in juxtaposition to the head apertures, and a gas supply means in communication with the head.

2. An igniter torch comprising a vertically disposed head having a plurality of radially disposed apertures, a vertically disposed closed bell having a closed top incasing the head, the bell being provided with a series of radially disposed vent holes, each being in register with a head aperture, a pilot nozzle extending into the bell in juxtaposition to the head apertures, and a gas supply means in communication with said head.

3. In a gas stove provided with a group of burners, the combination of an igniter torch located approximately centrally of the group, comprising a valve-controlled gas supply pipe, a head in communication therewith about which the burners are grouped, the head being provided with an individual gas-discharge aperture alined with each burner and leak apertures below the gas-discharge apertures, a vertically disposed bell incasing the head provided with vent-holes each being in register with a gas-discharge aperture of the head, the mouth of the bell being upon a lower plane than that of the burners to form an air intake, means for securing the top of the bell to the head, means carried by the head for adjusting the flow of gas to its discharge apertures, and a pilot nozzle extending into the bell in juxtaposition to the leak apertures of the head and below the same.

4. In a gas-stove provided with a group of burners; the combination of an igniter torch located approximately centrally of the group, the torch comprising a vertically disposed head having a channel provided with gas discharge apertures adjacent to its upper end, each aperture being alined with a burner, a vertically disposed bell fitted over the head provided with vent-holes in register with the head apertures, the mouth of the bell being upon a lower horizontal plane than that of the burners to form an air intake shield whereby oxygen is supplied

to the torch and burner flames from different stratas of air, a cap-screw in threaded engagement with the head channel, a valve-plug carried by the head for controlling its channel, and a pilot-nozzle extending into the bell its mouth being in juxtaposition to the gas-discharge apertures of said head.

In testimony that we claim the foregoing we have hereunto set our hands at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

JULIUS F. RUTZ.
JULIUS K. LUETHE.

Witnesses:
GEO. W. YOUNG,
MAY DOWNEY.

DEFENDANTS' EXHIBIT N

Patent No. 1,175,527—Hood for Flash Igniters—E. C. Kahn—March 14, 1916.

260

E. C. KAHN.

HOOD FOR FLASH IGNITERS.

APPLICATION FILED MAR. 3, 1915.

1,175,527. Patented Mar. 14, 1916.

Fig. 1.

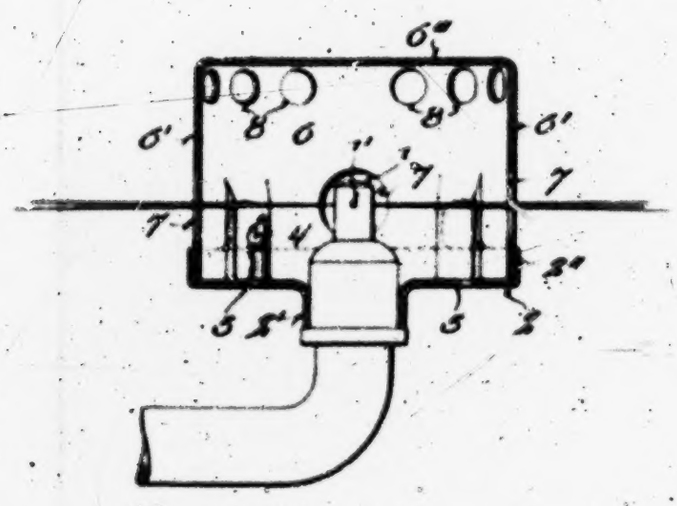


Fig. 2.



Fig. 3.



Witnesses:

Inventor:

Edward C. Kahn

by Victor J. Evans & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD C. KAHN, OF MILWAUKEE, WISCONSIN.

HOOD FOR FLASH-IGNITERS.

1,175,527. Specification of Letters Patent. Patented Mar. 14, 1916.

Application filed March 3, 1915. Serial No. 11,919.

To all whom it may concern:

Be it known that I, EDWARD C. KAHN, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Hoods for Flash-Igniters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention refers to the general type of hooded flash torch utilized for igniting grouped gas stove burners and has for its object to provide a simple, economical and effective hood for such flash torches.

Heretofore, so far as I am aware, the general practice has been to utilize either an open top hood for incasing the gas supply head or a closed dome hood. Practice has demonstrated that where an open top hood has been employed, cross-currents of air frequently snuff out the constantly burning pilot-light and hence the closed dome type of hood is the preferable construction. Objections have been found, however, to a dome wholly closed in the top portion for the reason that the constantly ascending current, composed of the products of combustion, is deflected downwardly by the hood into the path of the incoming fresh air, which feeds the flame, and therefore vitiates it in a manner to interfere seriously with proper combustion and at times to snuff out the pilot light altogether by exclusion of oxygen from the flame. This condition also causes the burning pilot-light to emit obnoxious odors and the partly smothered flame also causes sooty deposits, both upon the burner head and walls of the hood.

My invention is designed to overcome the above referred to objections in a closed hood and it consists essentially in the arrangement of a series of vents disposed above the usual firing ports of such hoods.

Another feature of my invention is to provide a bottom spider for the hood, whereby the same may be conveniently removed for cleansing and the separable construction also renders the device simple in manufacture and convenient in assemblage.

With the above objects in view the invention consists in certain peculiarities of construction and arrangement of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a sectional elevation of a gas-supply head incased within a hood embodying the features of my invention, and Figs. 2 and 3, perspective views of the dismantled hood members.

Referring by characters to the drawings, 1 represents a gas-supply head provided with a series of radially disposed apertures 1′ for the discharge of a corresponding series of jet flames to associated gas stove burners, not shown. The head is supplied with gas under valve control, whereby restricted quantities of the gas are caused to flow from the apertures to form a constant burning pilot-light and when the flow of gas is increased the auxiliary volume will cause a series of jet flames to be emitted from the head, as indicated in Fig. 1 of the drawings. All of the above described mechanism, however, forms no part of my present invention.

The hood elements, which are designed to incase any type of head, comprise a spider 2 in the form of a circular disk having a central aperture therein provided with a downturned flange 2′ for engagement with the head. The rim of the spider is provided with an upturned flange 2″, from the edges of which a series of inwardly offset and upwardly projecting tongues 4 extend. The body of the disk is provided with a series of air inlet apertures 5, whereby oxygen is supplied to the head for proper combustion. Removably seated upon the spider is an inverted cup-like hood 6, the side walls 6′ of which are provided with a series of depressions 6″ extending for a predetermined distance from its mouth adapted to have sliding engagement with the tongues of the spider. The side walls of the hood are also provided with a series of firing ports 7, which are so positioned with relation to the tongue-receiving depressions as to register with the firing apertures of the head.

The side walls of the hood are also provided with a series of vent apertures 8 positioned just below the dome wall 6‴ of the hood, as shown, which vent apertures are so proportioned with relation to the air inlet apertures 5 of the spider as to produce perfect combustion with relation to the constantly burning pilot-light.

From the foregoing description it is apparent that, owing to the hood vents above the firing apertures, there is no liability for the accumulation of a strata of vitiated air or products of combustion above the burner

head to flatten or snuff out the pilot-light. This result is due to the fact that the proper amount of oxygen is admitted from below for combustion and the spent products are carried off through the vent openings 8. Furthermore, it will be seen, owing to the fact that the air intake apertures 5 and vent apertures 8 are uniformly disposed about the pilot-light, the currents of air entering and discharging from the closed hood will flow uniformly about the head, whereby cross-currents are eliminated, which cross-currents would otherwise snuff out or cause the pilot-light to waver and, as previously mentioned, this construction also eliminates the tendency of the low-burning pilot-light to foul the ports in any way, resulting in obnoxious odors.

I claim:

1. A substantially closed dome hood for flash igniters comprising an inverted one-piece cup-like member having a series of firing ports therein, and a series of vent apertures above the firing ports.

2. A substantially closed dome hood for flash igniters comprising an inverted one-piece cup-like member having a series of firing ports therein, a series of vent apertures formed in the wall of the dome above the firing ports, and a spider for supporting the inverted mouth of the cup-like hood.

3. A hood for flash igniters comprising an inverted one-piece cup-like member, the side walls of which are provided with firing ports adjacent to its inverted mouth and vent ports adjacent to its top wall.

4. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece closed dome hood for incasing the head, the hood being provided with firing ports in register with said head, and vent apertures above the firing ports.

5. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece closed top dome hood for incasing the head, the same being provided with firing ports in register with the head apertures and a series of vent apertures above the firing ports, and a spider for supporting the hood having air inlet apertures therein.

6. A one-piece closed top dome hood for flash igniters comprising an inverted cup-like member provided with a series of firing ports and vent ports above the firing ports, and a spider for detachable connection with the inverted mouth of the cup-like hood.

7. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece hood incasing the head and closed at the top, said hood having a series of vent apertures in its side walls adjacent to the top and also having firing ports located below said apertures in registry with the apertures in the head.

8. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece hood incasing the head and closed at the top, said hood having a series of vent apertures in its side walls adjacent to the top and also having firing ports located below said apertures in registry with the apertures in the head, and means for supplying air to the hood from the bottom.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

EDWARD C. KAHN.

Witnesses:
GEO. W. YOUNG,
M. E. DOWNEY.

DEFENDANTS' EXHIBIT N

Patent No. 22,771—Lamp—H. Knowles—January 25, 1859.

263

H. KNOWLES.

Lamp

No. 22,771. Patented Jan. 25, 1859.

Fig. 1.



Fig. 2.



Witnesses:

Inventor:
H Knowles

UNITED STATES PATENT OFFICE.

H. KNOWLES, OF NEW LONDON, CONNECTICUT, ASSIGNOR TO FELLOWS, HOFFMAN & CO., OF NEW YORK, N. Y.

LAMP.

Specification of Letters Patent No. 22,771, dated January 25, 1859.

To all whom it may concern:

Be it known that I, HEZEKIAH KNOWLES, of the city of New London and State of Connecticut, have invented a certain new and useful Improvement in Lamps for Burning Lard, Tallow, and other Concrete Fats, but Which is Applicable to Burning other Substances; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is an elevation of a pedestal lamp with my improvement applied, and Fig. 2, a vertical section thereof.

The same letters indicate like parts in both figures.

Serious difficulties have been experienced in producing a clear and steady flame in lamps for burning concrete fats, and specially tallow, and also in supplying the material to the wick in a sufficiently fluid state to prevent the wick from carbonizing to such an extent as in a short time to seriously check the capillary attraction by which the material is supplied in the liquid state to the upper part of the wick.

The object of my invention is to remedy the difficulties heretofore experienced, and to this end, my said invention consists in combining with the deflector which has heretofore been employed in lamps for directing a current of air across the flame above the wick, and with a surrounding chimney provided with suitable apertures for the admission of a current of air inside the chimney and outside of the said deflector, a second deflector which surrounds the wick tube at or near the upper edge thereof, leaving a narrow space between the edge of the said deflector and the wick tube for the passage upward of a current of air all around the wick, the said deflector being extended outward to the neck or ferrule at the neck of the lamp to form a chamber with apertures all around for the admission of air which becomes highly heated before escaping upward around the wick tube

In the accompanying drawings (*a*) represents the glass reservoir of a pedestal lamp, made of the required capacity, for containing a sufficient supply of tallow, or other concrete fat, or other suitable material to be burned with a wick. The upper part of the said reservoir is formed with a neck to which is properly secured a metallic ferrule (*b*) which carries a flat metallic wick tube (*c*) extending down into the tallow or other material and suitably formed for conducting the heat to melt the tallow, &c., if applied to burning concrete fats, and provided also with suitable means, as at (*d*) for elevating or depressing the wick. This wick tube is connected with the ferrule by arms or a plate (*e*). And above the arms or plate (*e*) there is what may be termed a diaphragm deflector (*f*) fitted to the inside of the ferrule near the upper edge thereof, and which extends inward to within a very short distance of the wick tube and nearly on a level with the upper edge thereof. It should not extend above the wick tube but may be slightly below, the position represented in the drawings I have found in practice to be the best. I have contemplated fitting the said diaphragm deflector to the ferrule so as to slide therein with suitable means for adjusting its height relatively to the upper edge of the wick tube, as other deflectors have heretofore been made adjustable. The chamber (*g*) thus formed within the ferrule by this deflector confines the heat; and air is admitted to this chamber through a range of holes (*h*) in the periphery of the ferrule. The air thus admitted is heated and rarefied by the heat within the chamber, and rising in consequence escapes upward with great velocity in a thin film around the wick tube to feed the flame at the upper edge of the wick tube, the position of the deflector, relatively to the upper edge of the wick tube, inclining the current all around inward toward the wick; hence the importance of an accurate adjustment of the position of the deflector.

Above the wick tube is placed the usual deflector (*i*) for supplying air to the flame above the wick. It is formed in the shape of a semisphere with an elongated aperture at top of the form of a horizontal section of the wick tube, but a little larger. The base spreads out, and is provided with a cylindrical ring, as at (*j*) to fit over the upper part of the ferrule, with what is termed a bayonet joint, so that it can be readily taken off and put on, and secured in place. A series of holes (*k*) are made all around through the base for the admission of air to feed the flame above the wick. In this way a second chamber (*l*) is formed be-

tween the two deflectors and surrounding the lower part of the flame so that the heat given out by this part of the flame heats the lower diaphragm deflector, which, by conduction, heats the chamber (*g*) below, and in this way not only are the currents of air below the deflectors heated, the better to supply combustion, but more heat is conducted down to the tallow or other material in the reservoir, to keep the tallow, &c., in a fluid state, than can be obtained in lamps of any other construction, except such as have metallic conductors placed in the flame, such conductors being seriously objectionable.

The base of the upper deflector is provided with brackets (*m*) suitably formed to receive and hold the lower edge of the glass chimney, leaving an open space (*n*) for the free entrance of a current of air to the inside of the chimney to supply the required draft, and to feed the flame above the upper deflector. Without this latter supply of air the flame, however intense below the upper deflector, would give but a feeble light and would be liable to smoke.

I do not claim separately either of the deflectors above described, nor the introduction of a current of air at the base of the chimney and between it and the upper deflector. But

What I do claim as my invention and desire to secure by Letters Patent is—

The lower or diaphragm deflector surrounding the wick tube at or near its upper edge, substantially as, and for the purpose, specified, in combination with the upper deflector, and the chimney having suitable openings for the supply of a draft of air to the inside and to feed the flame outside of the upper deflector, substantially as and for the purpose specified.

HEZEKIAH KNOWLES.

Witnesses:
WM. H. BISHOP,
ANDREW DE LACY.

DEFENDANTS' EXHIBIT N

Patent No. 32,906—Lamp Burner—J. Thomas—July 23, 1861.

266

J. THOMAS.

Lamp Burner.

No. 32,906. Patented July 23, 1861.

Fig. 1.

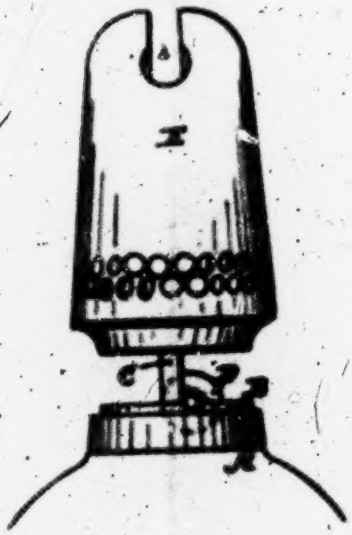


Fig. 2.

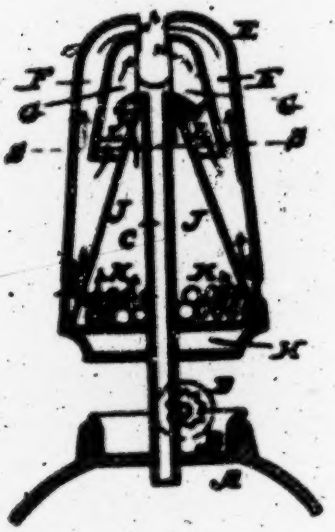


Fig. 3.



Witnesses:

Thomas D. Stetson

C. H. Babcock

Inventor.

Joseph Thomas

UNITED STATES PATENT OFFICE.

JOSEPH THOMAS, OF NEW YORK, N. Y.

LAMP.

Specification of Letters Patent No. 32,906, dated July 23, 1861.

To all whom it may concern:

Be it known that I, JOSEPH THOMAS, of the city, county, and State of New York, have invented a certain new and useful Improvement in Lamps; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, Fig. 2 a vertical section, and Fig. 3 a horizontal section on line S, S, in Fig. 2.

Similar letters of reference indicate like parts in all the figures.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation by the aid of the drawings.

A is the upper portion of the body of a lamp, B is a cap adapted thereto, C a flat-wick tube, D a spurred wheel by turning which the wick may be raised and lowered, and E a hemispherical cap. All these parts are similar to those in a great number of lamps in common use.

F is the outer side and G the inner side of a piece which is mounted in the position represented and which serves to conduct heat downward and to generate and direct an upward current of air to support the flame. It will be observed that the inner sides G, G, are not continued downward to so low a level as the outer sides F, F, but are sufficient to direct the presentation of the air to the flame and prevent its striking in a vertical or nearly vertical direction. The entire piece F, G, F, G, fulfils the functions performed by the tubes in my patent for improvement in lamps dated April 23, 1861.

H is a shelf fixed upon C.

J is a conical case resting upon H. It is perforated near its base with the holes K, and near its top by the holes L. Its top is fitted closely to the top of the wick-tube C, but it is not a part of the same piece of metal neither is it soldered to the same but is nearly or quite in contact therewith. In consequence of the slightness of this contact the conduction of heat from one piece to the other is slow. Currents of cold air are freely admitted through the apertures K and escape through L as represented by the arrows.

The piece F, G, is necessarily highly heated and as my lamp has been heretofore constructed the heat thereof has been transmitted to the wick-tube C to such extent as to slightly scorch the wick, but by my present invention this evil is avoided and the wick tube with its contents is kept cool. This is due partly to the simple fact that the interposition of the case J between G and the top of C retards the conduction of heat from G to C as also all radiation between these parts, and partly to the cooling effect of the draft of air admitted through K and escaping through L.

Having now fully described my invention what I claim as new therein and desire to secure by Letters Patent is—

1. Supporting the heating and deflecting piece F G upon the casing J which latter is interposed between the heating and deflecting piece F G and the wick tube C and so arranged as to retard the transmission of heat to the latter substantially as herein set forth.

2. In connection with the above allowing a portion of the air which passes between the heating and deflecting plates F G to first pass between the casing J and the wick tube C substantially as and for the purpose herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH THOMAS.

Witnesses:

THOMAS D. STETSON,

G. H. BABCOCK.

DEFENDANTS' EXHIBIT N

Patent No. 35,349—Lamp—C. F. Martine—May 20, 1862.

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C. F. MARTINE.

Lamp.

No. 35,349. Patented May 20, 1862.

Fig. 1.

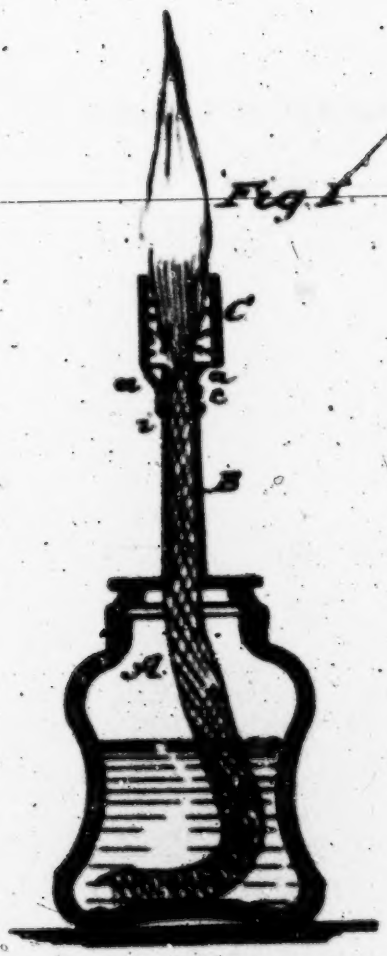


Fig. 2



WITNESSES

INVENTOR

UNITED STATES PATENT OFFICE.

CHARLES F. MARTINE, OF DORCHESTER, ASSIGNOR TO HIMSELF, AND RUFUS H. EMERSON, OF LYNNFIELD CENTRE, MASSACHUSETTS.

IMPROVEMENT IN LAMPS.

Specification forming part of Letters Patent No. 35,349, dated May 20, 1862.

To all whom it may concern:

Be it known that I, CHARLES F. MARTINE, of Dorchester, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section through a lamp having my improvement attached thereto. Fig. 2 is a view of the attachment which constitutes my improvement.

The object of my invention is to improve that class of lamps which are used without a chimney, and which from the imperfect combustion of the kerosene or other fluid used are liable to smoke; and my invention consists in attaching to the lamp a tube of sheet metal or other suitable material of somewhat greater diameter than the wick tube or orifice and extending above it, so as to encircle the lower part of the flame, and by the heat which it retains assist in consuming the smoke and gases, which would otherwise escape by imperfect combustion.

That others skilled in the art may understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the lamp; B, the wick-tube, to the upper end of which is attached a perforated tube of sheet metal, C. (Shown detached in Fig. 2.) It has three short legs, *a*, projecting from it, to which are attached a ring, *c*, which embraces the wick-tube. This may be made sufficiently tight to hold the tube C in place, or a ring, *t*, may be secured to the wick-tube, on which the ring *c* will rest. This tube C extends above the top of the wick-tube and surrounds the lower part of the flame, as shown in Fig. 1. When adjusted at the proper height, the flame burns above the tube C in a clear steady cone of light of much greater size and emitting a much greater amount of light without smoking than the same lamp would do without the attachment of the tube.

The form and dimensions of the tube C may be varied, as well as the material of which it is made, without departing from the spirit of my invention; but the construction here shown is that which I prefer. For example, the tube may be made tapering, or its sides concave or convex, or when applied to a flat wick may be shaped to correspond with it. I have also tried the plain metal without the perforations, but consider that the perforated tube gives the best result, as it admits a larger amount of air to the flame. I deem it essential, however, to produce the best effect, that the tube should be open at both top and bottom. I am aware that a metal cap has been applied to a lamp with a chimney, as in the "kerosene-lamp," so called; but in this case the cap was set upon the top of the lamp and was surrounded by a chimney and could not be applied to such a lamp as is here represented.

What I claim as my invention, and desire to secure by Letters Patent, is

The tube C, open at both its top and bottom, its lower end being at or near the top of the wick-tube and its upper end projecting above the wick, the whole constructed, arranged, and operating substantially in the manner and for the purpose specified.

CHAS. F. MARTINE.

Witnesses:
THOS. R. ROACH,
EDMUND MASSON.

DEFENDANTS' EXHIBIT N

Patent No. 318,030—Lamp Burner—E. B. Requa—May 19, 1885.

270

(No Model.)

E. B. REQUA.

LAMP BURNER.

No. 318,030. Patented May 19, 1885.

Fig 1

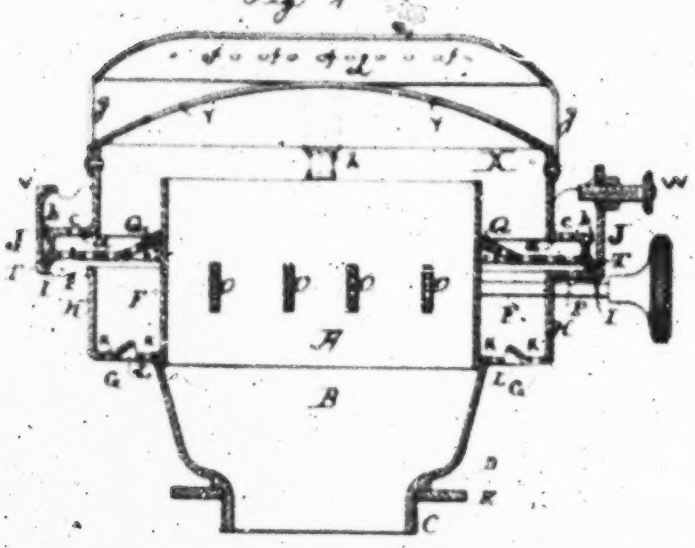


Fig 2

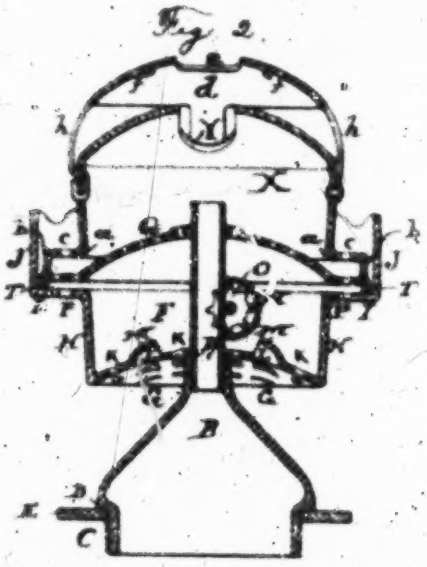


Fig 3

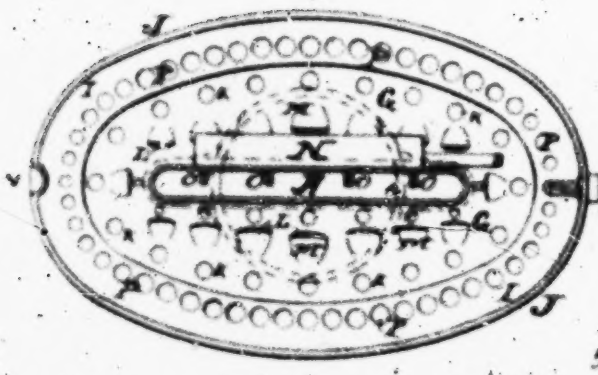


Fig 4

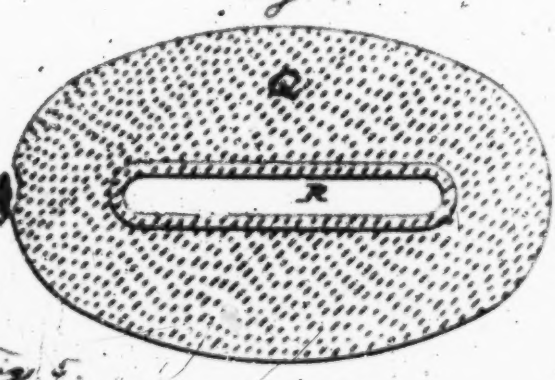
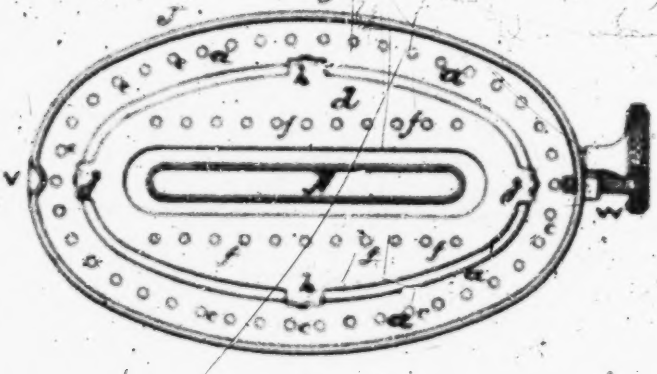


Fig 5



WITNESSES:
Herman Gustave
William B. Ellison

INVENTOR
Elias B. Requa
BY
Chas. E. Gill
ATTORNEY.

UNITED STATES PATENT OFFICE.

ELIAS B. REQUA, OF JERSEY CITY, NEW JERSEY.

LAMP-BURNER.

SPECIFICATION forming part of Letters Patent No. 318,030, dated May 19, 1885.

Application filed April 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, ELIAS B. REQUA, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Lamp-Burners, of which the following is a specification.

The invention relates to improvements in lamps; and it consists in a burner of novel construction, the operation and arrangement of the parts of which are fully set forth hereinafter, reference being therein made to the accompanying drawings, which form a part of this application, and in which—

Figure 1 is a central vertical longitudinal section of an embodiment of the invention. Fig. 2 is a central vertical transverse section of same. Fig. 3 is a top view of the burner, the flame dome or deflector and foraminous plate being removed for purposes of illustration. Fig. 4 is a view of the foraminous plate, and Fig. 5 is a top view of the complete burner.

Referring to the drawings, A denotes the wick-tube, which is elongated and secured upon the upper edges of the cone B, through which the wick passes on its course through the tube A and by means of the thread C, on the lower edge of which the burner is secured upon the lamp-fount. The cone B is circular in outline at its base, and thence its opposite sides deflect inward and upward toward the sides of the tube A, while the ends of the cone diverge upward and outward toward the ends of the tube A. Thus while the base of the cone is circular, the length of the body thereof is of greater dimension than its width. This construction of the cone B is illustrated in Figs. 1 and 2, and it subserves the very important purpose of permitting the employment of a much larger wick than would be possible were the cone of a different form, without necessitating an enlargement or a detraction from the appearance of the burner.

In order to insure the firm connection of the burner with the oil-fount, I have provided the lower portion of the cone B with an annular bead, D, and an internally-threaded disk or washer, E, either or both of which may be used at pleasure.

The wick-tube A is surrounded by the bowl F, which in the present instance is oval in horizontal section, and it consists of the base G, the vertical wall H, horizontal portion I, and chimney-retaining flange J. The central portions of the base G closely encompass the wick-tube A, and serve as a means of connecting the bowl with the burner, the other portions of the bowl being suitably removed from the wick-tube to meet the purposes of the invention, as illustrated in Figs. 1 and 2. The base G is curved upward at its center, and is provided with the apertures K and openings L, these latter being covered above with the deflectors M, which incline upward toward the wick-tube A, and operate to direct the air entering through the openings L against the wick-tube, whereby when the burner is in use a constant volume of cool air is directed against the sides and ends of the tube.

Upon one side of the tube A is provided the box N, which incloses the wick-raising wheels O of the usual construction.

The horizontal portion I of the bowl F contains perforations P, and supports between said perforations and the flange J, the foraminous cone-shaped plate Q, the center of which has an elongated opening, R, to permit of the insertion of the plate over the wick-tube.

The outside edges of the plate Q have a depending flange, T, which rests upon the portion I of the bowl F and forms an air-space between the plate and part I. Thus the plate Q does not interfere with the proper operation of the apertures P.

The retaining-flange J will be of suitable height and construction, and is supplied with the lip V and set-screw W, to engage the lower edge of the chimney in the customary manner.

The flame dome or deflector X has the usual flame-slot, Y, and at its base is formed the horizontal chimney-support *a* and vertical flange *b*, the former containing a line of apertures, *c*, leading within the chimney, and the flange *b* serving to support the dome X and elevate the part *a* from contact with the foraminous plate Q. A deflector, *d*, containing a flame-slot, *e*, and perforations *f*, is superposed over the dome X, being supported in position by the end lips or lugs, *g*, and the side lips, *h*, the lower ends of the lips being secured to the

sides of the dome either by riveting or by passing them through slots formed therein or otherwise, as indicated in Fig. 2. The deflector *d* is curved to correspond with the curvature of the top of the dome X, so as to carry the air into the flame when the burner is in use, and its edges are free and uninclosed except by the lips *g h*. The lips *g*, in addition to supporting the deflector *d*, perform the important function of preventing the spread of the flame into the shape of a fan, it being one of the principal objects of the present invention to produce a broad rectangular shaped flame.

It should be noted that the wall H of the bowl F is in line with the vertical wall of the dome X, and that the burner contains no parts which can interfere with the proper circulation of air through the same, either by forming eddies thereof, (which has proved fatal to so many burners,) or otherwise.

Upon considering the construction of the burner its operation will be apparent. The air which passes through the base G is in part directed over the sides and ends of the wick-tube, while the other portion ascends over the wall H. All of the air thus passing through the base G previously circulates over the cone B, keeping it cool, and afterward rises through the foraminous plate Q to the flame. The outside drafts pass through the apertures P, plate Q, and apertures *e* to the inside of the chimney, whence they ascend over the outside walls of the dome X and under the deflector *d* to the flame, a portion of the air being permitted to rise through the apertures *f*, whereby any possibility of an unduly strong current of the air into the flame or the formation of eddies is avoided. The effect of the air deflected by the opposite sides of the deflector *d* is to hold the flame steadily in position and to mix fresh air at the outlet from the dome with the air which has been heated in the dome, and thus to restore as near as may be the combustible qualities of the partially-exhausted air at a point adjacent to the hydrogen part of the flame. The parts of the burner are so constructed and arranged that the currents of air circulate freely over and about the same, and are thoroughly diffused and properly fed to the flame.

In an application for Letters Patent of even date herewith and having serial number 129,037, I describe the burner which is the subject of this application in connection with a chimney, the chimney being the form at present thought most desirable for use on the burner described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a lamp-burner, the wick-tube, in combination with a flame-dome and the encircling bowl F, the base of which is provided with openings I, and deflectors M, substantially as set forth.

2. A lamp-burner consisting of the bowl F, encircling the wick-tube, and composed of the perforated base, wall H, horizontal portion I, and flange J, in combination with the foraminous plate Q and dome X, an air-passage being provided at the base of the latter for permitting the entrance of air into the chimney, substantially as set forth.

3. A lamp-burner consisting of the bowl F, inclosing the wick-tube A and box N, which covers the wick-raising wheels O, in combination with the dome X, the bowl F being provided with apertures for the passage of air, and an air-passage at the base of the dome being also provided to permit the entrance of air into the chimney, and the bowl and dome being substantially in line with each other, as and for the purposes described.

4. In a lamp-burner, the combination of the wick-tube, bowl F, having a perforated base and perforations P, foraminous plate Q, and dome X, having perforations *e*, the vertical walls of the bowl and dome being substantially in line with each other, as described.

5. In a lamp-burner, the combination of the wick-tube, the bowl F, consisting of perforated base G, wall H, perforated portion I, and flange J, the foraminous plate Q, having flange T, the dome X, whose vertical walls are in line with those of the bowl F, and having the perforated chimney-support *a* and flange *b*, substantially as specified.

6. A lamp-burner consisting of the bowl F, inclosing the wick-tube and composed of the perforated base, walls H, horizontal portion I, and flange J, in combination with the foraminous plate Q, having the flange T, and the dome X, having the flange *b*, the said dome and bowl being in line with each other, as described.

Signed at New York, in the county of New York and State of New York, this 15th day of April, A. D. 1884.

ELIAS B. REQUA.

Witnesses:
HERMAN GUSTOW,
CHAS. C. GILL.

DEFENDANTS' EXHIBIT N

Patent No. 577,090—Safety Lamp—Frederick A. E. Wenzel—February 16, 1897.

273

No Model.

F. A. E. WENZEL.

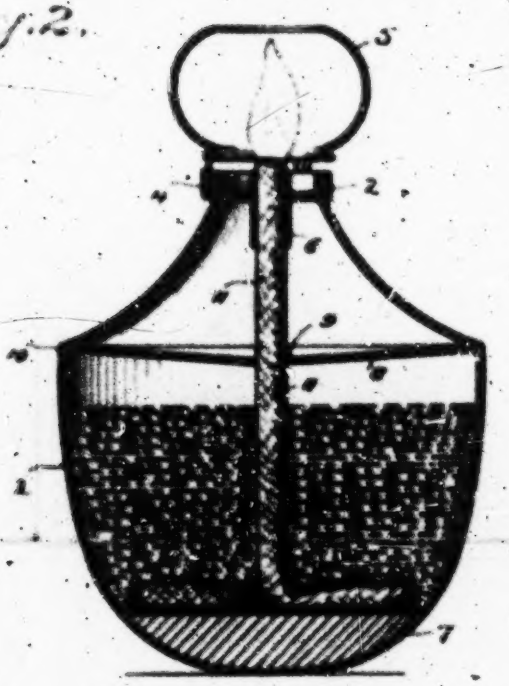
SAFETY LAMP.

No. 577,090 Patented Feb. 16, 1897.

Fig. 1.



Fig. 2.



WITNESSES

L. A. Lamb

S. V. Richardson.

INVENTOR

Frederick A. E. Wenzel

By C. F. Wooster Atty.

UNITED STATES PATENT OFFICE.

FREDERICK A. E. WENZEL, OF DANBURY, CONNECTICUT, ASSIGNOR TO ALBERT F. PIERCE AND REBECCA N. PIERCE, OF SAME PLACE.

SAFETY-LAMP.

SPECIFICATION forming part of Letters Patent No. 577,090, dated February 16, 1897.

Application filed December 26, 1895. Serial No. 573,334. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. E. WENZEL, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Safety-Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a safety-lamp adapted for general use in either a portable or stationary capacity, for example, as a pocket-lamp or a night-lamp, the special features of novelty being that the lamp is self-righting under all circumstances and that the body or reservoir is provided with a diaphragm which renders passage of the contents of the reservoir to the upper portion thereof practically impossible should the lamp be upset. With these ends in view I have devised the novel construction of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to designate the several parts.

Figure 1 is an elevation, the closing-cap being in section; and Fig. 2 is a vertical section of the entire lamp, a globe-ring and globe being shown in position instead of a closing-cap.

1 denotes the body or reservoir of the lamp, which may be of any suitable shape, as my invention is not limited to any special configuration, but is preferably made of substantially the configuration shown in the drawings—that is to say, the bottom or lower portion of the body is spheroidal in form until a shoulder 10 is reached, from which point the body diminishes in diameter toward the top, the lines of the sides in the present instance being concave curves. The body may be made in one piece or two, as preferred. At the top of the body is the usual threaded ring 2, which is adapted to receive either a closing-cap 3, as in Fig. 1, or a globe-ring 4, as in Fig. 2.

5 indicates a globe or shade, which may or may not be used when the lamp is used as a night-light.

6 denotes a wick-tube, which may be of any ordinary or preferred construction and may or may not be provided with a wick-raising device. I have shown a short tube adapted to receive a round wick and without a wick-raising device, it being preferred by many in this class of lamps to lift the wick when necessary with any sharp instrument and to do away wholly with a mechanical raising device.

The essential features of my novel lamp are, first, a weight 7, which is placed wholly at the bottom of the reservoir, so as to always hold the body in an upright position, and should the lamp be forcibly overturned to return it instantly to its upright position as soon as the influence which has carried it out of the upright position is removed, and, second, a diaphragm 8, placed entirely across the body of the lamp on its inner side and above the center, but below the top, said diaphragm inclining slightly downward from its edge to the center and being provided at the center with an opening 9, which just permits the wick to pass through. The action of this diaphragm is to retain the contents of the body or reservoir at the bottom thereof should the lamp be overturned. The position and shape of this diaphragm coact with the external shape of the body in insuring the return of the lamp to an upright position, for the reason that the oil is prevented from passing into the upper part of the body. Furthermore, this diaphragm being nearly flat and extending from the sides of the lamp-body below the top serves to prevent oil from passing to a part of the lamp that would tend to keep it on its side when knocked over. This function is not possessed by a tube or diaphragm which is cone-shaped and extends downward from the top of the lamp-body.

It is of course obvious that should the reservoir be more than half full, and should it be held in a horizontal or nearly horizontal position for some little time, a portion of the contents of the reservoir might pass through the diaphragm at the wick-opening. This of course is unavoidable; but by making the diaphragm to incline downward from the edge toward the wick-opening I insure that the instant the lamp is righted again all of the contents of the reservoir that may have passed

through the wick-opening will at once pass back again into the reservoir below the diaphragm.

Owing to the arrangement of the diaphragm, as above described, whereby the oil is confined to the lower part of the reservoir, the weight of the oil cooperates with the lead or other weight at the bottom in insuring the return of the lamp to an upright position. Therefore a less amount of lead or other solid weight is required, and the lamp is in consequence lighter than would be the case in a self-righting lamp if the oil were free to flow into the upper part of the reservoir when the latter is turned on its side.

Having thus described my invention, I claim—

1. A safety-lamp provided with a body having a weight at the bottom and a diaphragm extending from the sides thereof below the top and which inclines slightly downward from its edge to the center and is provided at the center with an opening through which the wick passes, said wick closely fitting the opening.

2. A safety-lamp having a body the lower portion of which is spheroidal in form and is provided with a weight placed wholly at the bottom and a diaphragm extending from the sides thereof below the top and which inclines slightly downward from its edge to the center and is provided at the center with an opening through which the wick passes, said wick closely fitting the opening, substantially as described, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK A. E. WENZEL.

Witnesses:
JAMES B. WILDMAN,
CHARLES W. MURPHY.

DEFENDANTS' EXHIBIT N

Patent No. 1,036,514—Torch—H. H. Nichols—August 20, 1912.

276

H. H. NICHOLS.

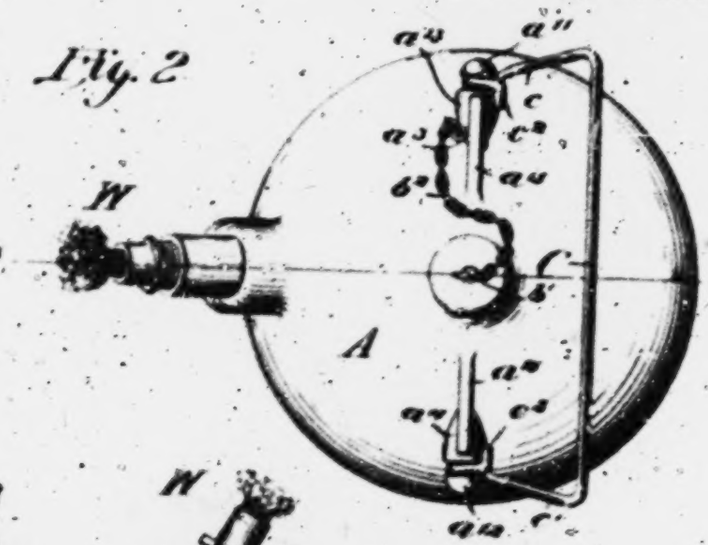
TORCH.

APPLICATION FILED MAY 14, 1912.

1,036,514.

Patented Aug. 20, 1912.

Fig. 2



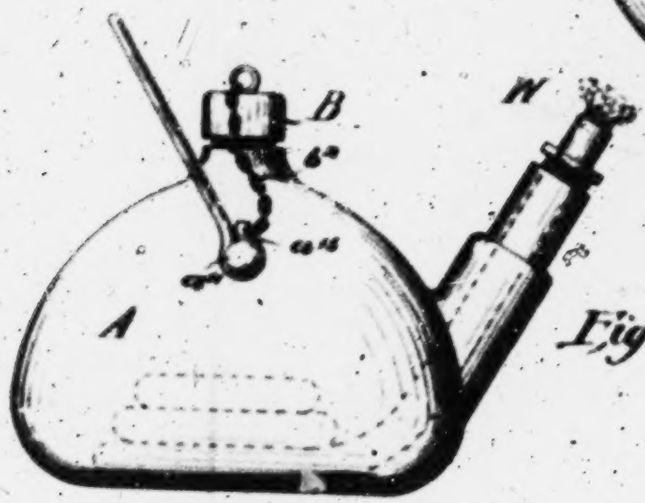
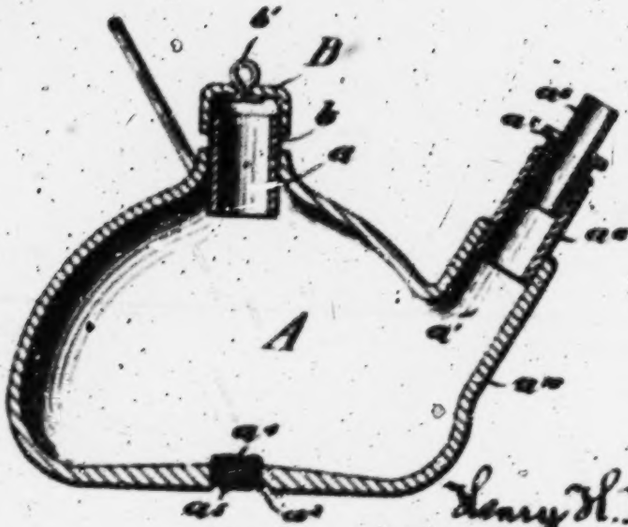


Fig. 1.

Fig. 3.



Witnesses

C. S. Freeman

James H. Mon

Inventor

Henry H. Nichols,

By Edward H. Clement

Attorney

UNITED STATES PATENT OFFICE.

HENRY H. NICHOLS, OF PHILADELPHIA, PENNSYLVANIA.

TORCH.

1,036,514. Specification of Letters Patent. Patented Aug. 20, 1912.

Application filed May 14, 1912. Serial No. 697,139.

To all whom it may concern:

Be it known that I, HENRY H. NICHOLS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Torches, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to oil burning torches and has for its object the improvement of such devices so as to render them safer and more efficient than at present.

In order to attain my object, I provide the torch with a heavy cast iron body in tea kettle shape, with a swiveled screw cap held against loss by means of a chain, a long wick with detachable spout whereby it can be readily removed, replaced and adjusted, and a transverse bail or handle provided with means to prevent the flame from coming into contact with the hand in carrying. The body is of such shape as to remain in stable equilibrium when deposited even on rough ground or piles of material, and the wick tube is inclined at such an angle to the body that it may be placed in the most advantageous position to clear obstructions and furnish light in difficult places.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a side view of the torch, Fig. 2 is a plan view of the same, and Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

Referring to the drawings, A is the body, cast as already stated preferably of iron, cored out so as to have ample oil capacity and with three openings a, a' and a^2. Two of these openings a and a' receive nipples b and a^6 respectively, which are held in place in the mold and are cast into the body, so as to avoid the necessity for any further machine work or manipulation, thereby rendering the device cheap, efficient and easy to assemble. The opening a^2 is threaded to receive a screw plug a^4, the head of which is squared or slotted and countersunk so as to be flush with the bottom of the pot or body. The opening a' is to receive the wick, and the collar or nipple a^6 being cast into the main tube a^{10}, is internally threaded at its outer end to receive a flanged nut carrying the tip or wick holder a^8, which may be threaded or otherwise secured on the collar a^7. The parts a^5 and a^8 may be made in one if desired, but for the sake of ease of manufacture and adjustment, I have found it desirable to make them in two parts as shown.

The bore of the tubular wick holder a^8 is smooth, and accurately proportioned to receive wicks of a predetermined size, clasping the same firmly against accidental displacement, and preventing both excessive flow of oil upward and the undue extension of combustion downward. To confine the oil at this point requires a good fit and in torches heretofore designed in which the spouts or wick holders have been made of pressed or cast metal without a separate holder, it has been found difficult to produce a uniformly good fit without hand work which is expensive and annoying.

The remarks applied to the wick holder are also in part applicable to the fitting for the cap, made in the form of a tube b cast into the upper opening in the body. By providing these extra parts it is possible to do the cutting and threading by automatic machine tools, very much more expeditiously and cheaply than would be possible if the weight of the body had to be handled and the openings directly tapped or otherwise worked.

Extending transversely across the top of the body is a bail C having its ends c and c' bent down and formed into eyes passing around the headed studs a^{11} and a^{12} which project in opposite directions from the two bosses a^{13} and a^{14} cast on the body. These studs are formed by supporting two wrought iron rivets in the mold, so that one end of each will be cast in the boss a^{13} or a^{14}. The extreme ends c^2 and c^3 of the downwardly bent portions of the bail are twisted around and then bent inwardly at right angles so as to lie parallel to the *main* portion or handle of the bail. Cast upon the top of the body and extending in opposite directions from the cap are two flanges or ribs a^{15} and a^{16}, the outer ends of which are integral with the bosses a^{13} and a^{14}. When the bail is turned up into a vertical position, the ends c^2 and c^3 come into contact with the flanges a^{15} and a^{16}, and prevent further rotation around the studs a^{11} and a^{12}. It is therefore impossible for the torch while being carried to swing upon its pivots in such manner as to bring the wick W with its flame into dangerous proximity to the hand of the carrier. At the same time the bail may be

dropped toward the back of the torch so as to present no obstruction to the removal of the cap. Of course this cap requires to be swiveled as shown so that it may be unscrewed when desired.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. A torch comprising a cast body having rounded contours and a broad flat base, with an inclined projecting tubular extension cast integral with said body, an opening cast in the upper part of the body and separately machined fittings secured in said extension and in said upper opening, for the purpose of receiving and holding a wick and a cap, respectively, substantially as described.

2. A torch having a body, an inclined tubular extension on one side of the body carrying a wick, a bail or handle secured transversely across the top of the body, and having its ends pivoted to the same, and means for limiting the backward swing of the body on its pivots with respect to the bail, whereby the approach of the torch flame to the hand of the carrier is prevented, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY H. NICHOLS.

Witnesses:
JAMES J. CLIFFORD,
WM. D. THUMBERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

DEFENDANTS' EXHIBIT N

Patent No. 1,610,301—Torch—W. J. McCloskey—December 14, 1926.

279

Dec. 14, 1926 1,610,301

W. J. McCLOSKEY

TORCH

Filed May 1, 1925

FIG. 1

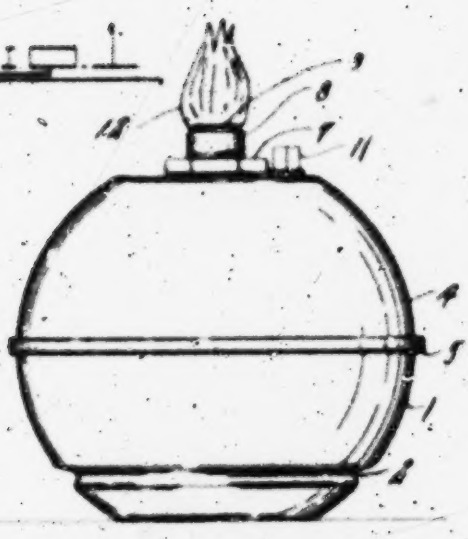


FIG. 2

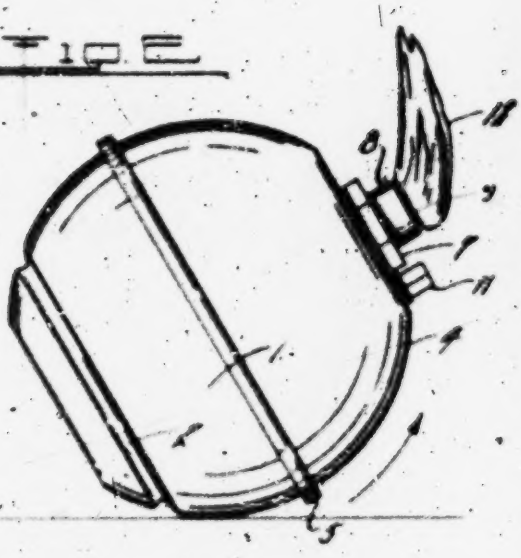


FIG. 3

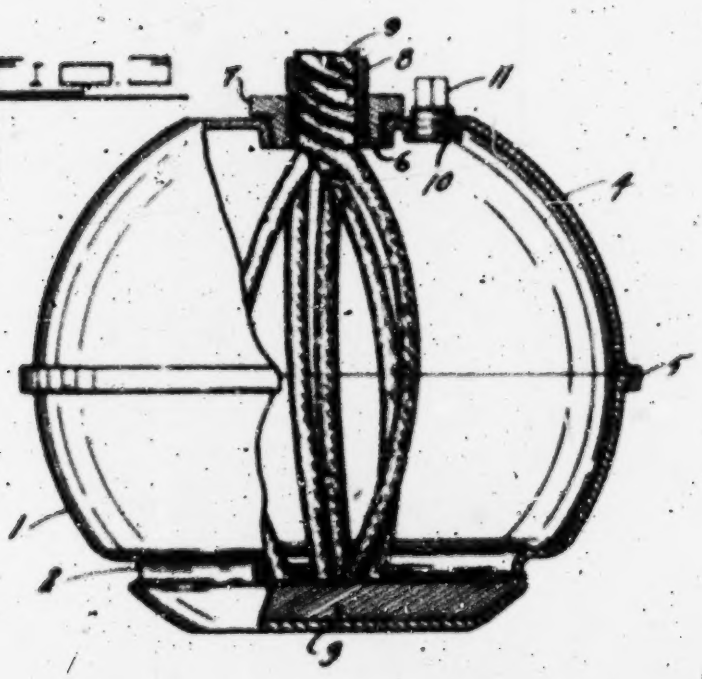


FIG. 4

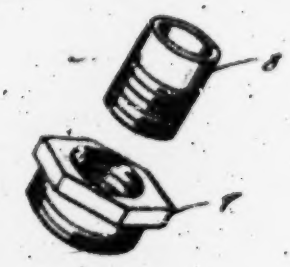


FIG. 5



William J. McCloskey

INVENTOR

BY

ATTORNEY

Patented Dec. 14, 1926.

280 1,610,301

UNITED STATES PATENT OFFICE.

WILBERT J. McCLOSKEY, OF TOLEDO, OHIO.

TORCH.

Application filed May 1, 1925. Serial No. 27,167.

This invention relates to jostling resistant and self-righting torches.

This invention has utility when incorporated in roadway excavation marking torches as subject to disturbance by traffic.

Referring to the drawings:

Fig. 1 is a side elevation of a torch in accordance with the disclosure herein as in normal position;

Fig. 2 is a view of the torch of Fig. 1 as disturbed and about to swing toward self-righting or stable position of Fig. 1;

Fig. 3 is a view of the torch of Fig. 1, with portions broken away, the scale being enlarged;

Fig. 4 is a distributed view of the wick enveloping nipple and bushing; and

Fig. 5 is a perspective view of the loading element for the torch.

Reservoir member 1 is shown herein as of a bore restricting form inwardly extending with annular re-entrant beading 2 as a holder for loading 3 herein shown as a cast plate within this sheet metal lower half of this shell of the spherical reservoir structure of this disclosure. Opposing this semi-circular reservoir element 1 is spherical or dome member 4. These members 1, 4, are herein shown as united by a joint, seam, or weld 5 in the region of the maximum diameter or bulge portion of this reservoir. The dome member 4 has central inwardly threaded throat 6 which is engaged by bushing 7 having nipple 8 therein as a guide for wicking 9. Adjacent this inwardly extending threaded throat 6 is minor throat providing threaded opening 10 in which filling opening plug 11 is disposed. Upon removing the filling opening plug 11, material for combustion, as kerosene, may be introduced into this reservoir or receptacle. The wicking 9 may be worked into and through the nipple 8 to leave the desired extent of the wicking 9 protrude therefrom and then through the larger opening provided by this throat 6 of this sheet metal upper member 4, the loose wicking may be thrust and the bushing 7 assembled into locking position in the opening or throat 6.

This sheet metal unitary structure providing a vessel, is resistant against impact from horses' hoofs or vehicle wheels and when kicked, knocked, or struck will readily shift away from such source and if this be a tendency to disturb the condition of the reservoir as to its base, it normally is matter of but momentary disturbance, for the vessel at once is self-righting so that it will approximate the position or placing in the indicating or guarding of the excavation as in laying or repairing of tracks or pavement with flame 12 of the torch from the upper side of this vessel.

This vessel as made from sheet metal elements 1, 4, is of light weight and tough throughout. The walls are stiff against battering while the loading or weight 3 in the bottom of the vessel is of a mass sufficient to load the vessel for ordinarily racking the vessel into its upright position for normal operation of the wick 9 for delivering by capillary attraction the kerosene for burning at the flame 12.

What is claimed and it is desired to secure by United States Letters Patent is:—

1. A torch reservoir housing comprising a dome shaped upper section, a complemental zone shaped base section, and a load within said base section, whereby rocking of the torch is on a spherical bearing of the base section continuous in spherical curvature from the lateral bounding means of the base section as enveloping the load.

2. A torch reservoir housing comprising a dome shaped upper section, a complemental zone shaped base section having an endless bead, and a rigid load element within the housing for the base section disposed inside said base section to be there retained by said bead, whereby said housing is rockably supported by said base section.

3. A torch complete in itself as to its support, said torch embodying a housing comprising a dome-shaped upper portion and a complemental zone shaped base portion, which portions together form a reservoir, said housing upper portion having an opening, a wick receiving bushing in said opening, and a loaded base anchored with the lower portion and disposed within the external radius of said housing, whereby rocking of the torch toward righting position is on a continuous spherical bearing from a tilted supporting side of said housing to a position of rest with its loaded base downward and the wick bushing upward with the housing portion thereabout convex downward.

In witness whereof I affix my signature.

WILBERT J. McCLOSKEY.

DEFENDANTS' EXHIBIT N

Patent No. 1,613,819—Torch—L. W. Close—January 11, 1927.

281

Jan. 11, 1927. 1,613,819

L. W. CLOSE

TORCH

Filed August 6, 1926

Fig. 1.

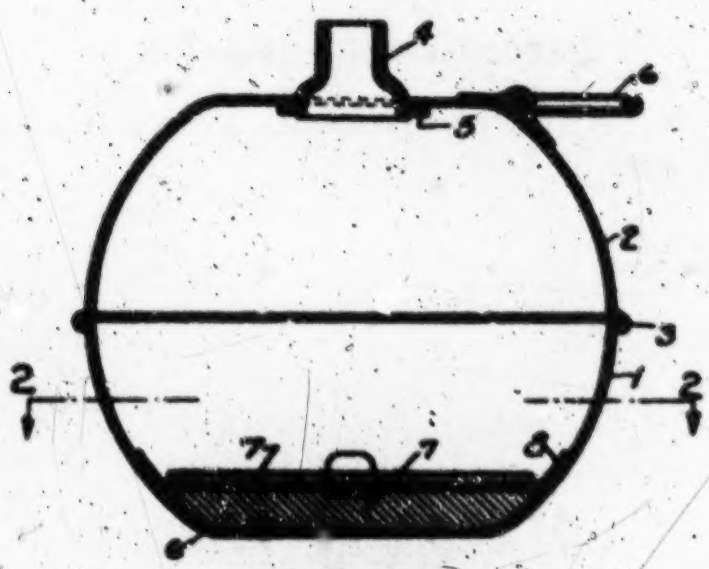


Fig 2.

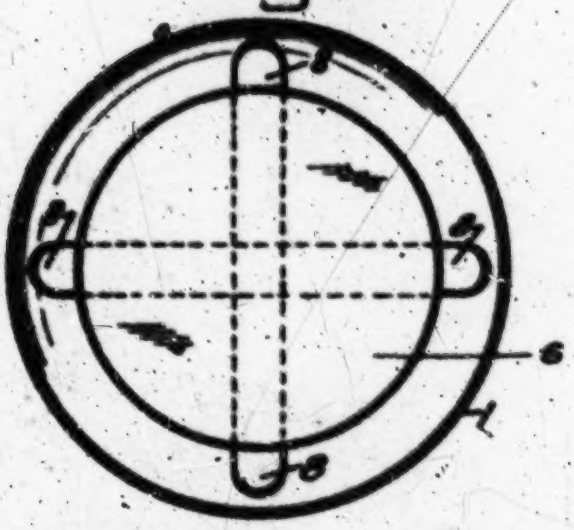


Fig. 3.



INVENTOR

BY Lyman W. Close

Owen & Owen

ATTORNEYS

Patented Jan. 11, 1927.

1,613,819

UNITED STATES PATENT OFFICE.

LYMAN W. CLOSE, OF TOLEDO, OHIO, ASSIGNOR TO THE TOLEDO PRESSED STEEL COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

TORCH.

Application filed August 6, 1926. Serial No. 127,492.

This invention relates to torches but more particularly to torches of the type used in connection with road repair or construction work for danger signals, and an object of this invention is to provide a torch with a counter weight for maintaining the torch in upright position which is mounted in the torch body in a simple and efficient manner enabling such counter weight to be fixedly secured in place readily and cheaply. Further objects and advantages will hereinafter appear.

The invention is shown by way of illustration in the accompanying drawings, in which—

Fig. 1 is a vertical sectional elevation of a torch embodying the invention; Figure 2 is a section on the line 2—2 of Figure 1; and Figure 3 is a detail sectional elevation of an alternate form.

The illustrated embodiment of the invention comprises a torch of sheet metal having a body portion formed of two parts, a base part 1 and an upper part 2. The bottom and top of the torch body are flattened and the side walls are rounded. In this instance, the adjoining edges of the top and bottom parts are seamed together as shown at 3. Formed centrally in the top of the upper part is an opening into which fits a spout or nozzle 4 screwed into a ring 5 spot welded to the inside of the torch body. A handle ring 6 may be suitably connected to the side of the torch to facilitate handling.

In torches of this character, it is highly desirable to provide a counter weight so that at all times an upright position is maintained and so that the torches are self-righting should they be knocked over. As shown a counter weight 6 is placed in the bottom of the torch body and is shaped to conform to the side walls of the torch body.

For securely holding the counter weight in place a pair of straps 7 spot welded together is embodied in the counter weight with the ends 8 projecting therefrom. The counter weight 6 may be cast around the straps so that a unitary arrangement is formed. The projecting ends 8 of the strap are bent upwardly to lie flat against the inner wall of the torch body. These ends are preferably spot welded to the torch so that the counter weight 6 is fixedly secured in place.

In the alternate form shown in Figure 2, the counter weight 6^a is similar in shape to the counter weight 6, but instead of utilizing straps to hold it in place, a cup-shaped member 9 rests against the top of the counter weight and has its edge portions 10 bent to conform to the inner wall of the torch body. The edge portions are spot welded at intervals to the torch so that relative movement between the counter weight 6^a and torch body is prevented.

While I have described my improved torch in more or less detail to comply with the requirements of this statute, it is nevertheless desired that this detailed description be considered merely as illustrative and not as limiting, and it is to be understood that changes and modifications may be made by those skilled in this art without departing from the invention as defined in the following claims.

What I claim is:

1. A torch comprising a body having a flat base and curved walls, a counter weight inside of said body and conforming to the side walls thereof, holding means extending across the upper portion of said counter weight, and upwardly bent end portions on said holding means to conform to the inside of said body, said upwardly bent portions being rigidly secured to the inside of said body thereby to hold said counter weight against movement.

2. A torch comprising a two part body, the lower part having a flat base and curved side walls, the upper part having curved side walls and a flat top, a seam connecting said parts together, a nozzle in the top of said upper part, a counter weight in said lower part having sides conforming to the shape of the side walls of the body, straps embedded in said counter weight, and upwardly bent end portions on said straps projecting beyond the ends of said counter weight and lying flat against the body, said bent end portions being secured to said body.

3. A torch comprising a two part body, the lower part having a flat base and curved side walls, the upper part having curved side walls and a flat top, a seam connecting said

parts together, a nozzle in the top of said upper part, a counter weight in said lower part having sides conforming to the shape of the side walls of the body, a retaining member engaging the upper portion of said counter weight and upwardly bent edges on said member conforming to the shape of the inner walls of said body, said upwardly bent edges being rigidly secured to said body thereby to retain said counter weight in place.

In testimony whereof I have hereunto signed my name to this specification.

LYMAN W. CLOSE.

Read what some of the users say

"TOLEDO TORCHES make an excellent danger signal to protect work and are not carried away like lanterns."

A. G. Sherwood,
Independence, Kan.

"In the time we have been using TOLEDO TORCHES we have lost none and have never found one of them not burning in the morning, notwithstanding the fact that we have had several severe wind and rain storms at night."

F. A. Flannagan,
Shawnee County Hwy. Dept.
Topeka, Kan.

"We like TOLEDO TORCHES because they stay with us. They're right there all night, every night, and after six months we still have our original six dozen. They do their stuff. We just fill 'em, fire 'em and forget 'em."

A. K. Erb,
State Road Commissioner of
West Virginia.

"We never had one blow out when torches are lighted at night. * * * We find them economical to use as there is absolutely no breakage and no chimneys to buy and not any spilling of oil caused from being blown over."

O. R. Huntley,
Toledo, Ohio.

"TOLEDO TORCHES are a great improvement over the old type of lanterns, in the saving of globes and attracting a great deal more attention, on account of its characteristic flickering."

Escanaba Power & Traction Co.
Escanaba, Mich.

"The TOLEDO TORCH is far superior to the old fashioned lantern and we like it very much."

Central Maine Power Co.,
Waterville, Me.

"We find TOLEDO TORCHES are much more satisfactory than lanterns, in that half the time the lantern chimney is so black with soot, no light is given out to do much good. There is so much light thrown out by the torch, it enables one to see what it's all about."

R. J. Cartledge,
City of Greenwood, S. C.

"After having more than twenty years of experience in protecting open trench work with red lights, white lights, and I dare say, all lights, am willing to say TOLEDO TORCH lights are the best."

H. Freeman,
J. B. McCrary Engr. Corp.,
Miami, Florida.

"With all due regard for honesty, I can truly say that as a highway torch for barricades or danger signals there is nothing on the market to equal THE TOLEDO TORCH."

Roy H. Schultz,
County Surveyor,
Paulding, Ohio.

"We are very well satisfied with the TOLEDO TORCHES as there are no globes to get broken and the torches are not as easily carried off as lanterns."

Globe Construction Co.,
Wichita, Kan.

"We find the TOLEDO TORCH to be very desirable for our work and find they will burn for about thirty-two hours on one filling and will also burn in any wind or rain."

P. F. Connelly Paving Co.
Little Rock, Ark.

"TOLEDO TORCHES are a decided improvement over the red lantern, both in efficiency and economy. * * * I expect to use them exclusively on my work in the future."

L. D. Harper,
Rocky Mount, N. C.

"For the safety of the travelling public, I think TOLEDO TORCHES offer a better safeguard than lanterns as they are visible for a greater distance and are much more conspicuous."

C. N. Johnston,
S. K. Jones Const. Co.,
Memphis, Tenn.

"The greatest advantage I find in using the TOLEDO TORCHES over the red lanterns comes in the form of having the travelling public respect your property rights."

Alex Jeffry,
Saginaw, Mich.

"This past summer has been a very good summer to test out torches because of the amount of hard rains, hail and winds and the TOLEDO TORCHES have always gone through every storm and still be upright and burning in the morning."

O. T. Tyler Const. Co.,
Blackwell, Okla.

"Your lights are fool proof * * * We have the reports of some of these lights having been stolen."

Dicus Brothers,
Waynesville, N. C.

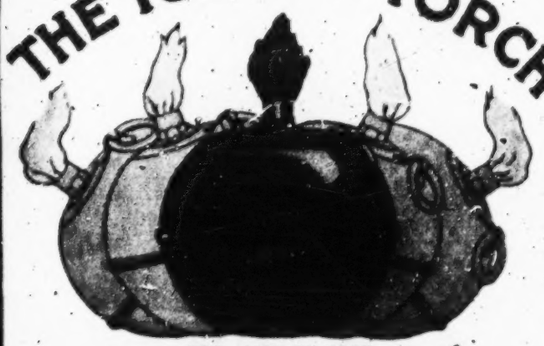
"Have put the TOLEDO TORCH in operation in all kinds of weather and find it far superior to the old fashioned lantern."

Sand Springs Ry. Co.,
Sand Springs, Okla.

DEFENDANTS' EXHIBIT O
Whole Circular of Plaintiff's Exhibit 8

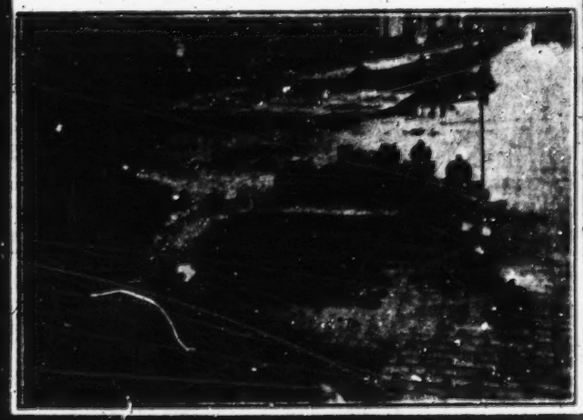
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THE TOLEDO TORCH



PAT. JAN. 11. 1927

RIGHTS ITSELF FROM ANY POSITION





THE TOLEDO TORCH "STANDARD"

Adopted by the Highway Departments of over half these United States, hundreds of counties, cities and public utilities, and many thousands of far-sighted contractors in every section of the country. Approved and recommended by U. S. Fidelity & Guaranty Co. Awarded AGC Seal for Successful Performance

THE TOLEDO TORCH will give you greater protection than you have ever had before and at lower cost. Burns with a distinctive light. Attracts and holds attention in competition with all other road lights. Has greater visibility. Completely illuminates the danger zone insuring utmost protection against accidents.

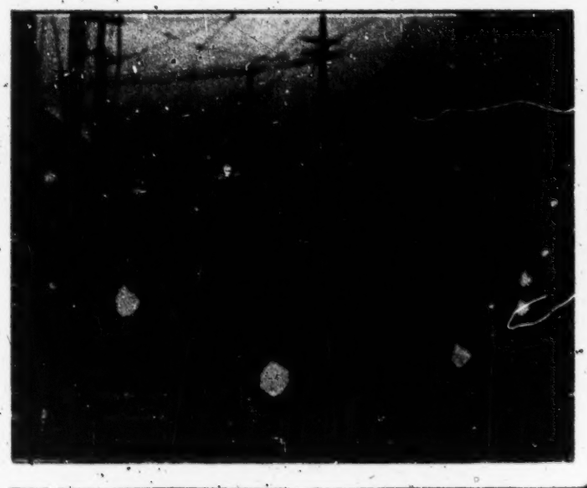
Its snappy self-righting action holds it to a given location. Can't tip over. Can't roll. It is reliable and safe.

The TOLEDO TORCH "STANDARD" is made of two steel hemispheres securely seamed together, and is unbreakable. It is not stolen because it is unsuitable for any other purpose, gets too hot and sooty to carry, and its ownership is too easily traced.

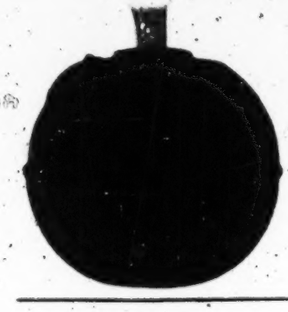
TOLEDO TORCHES also save you money by using cheaper fuel. Three quarts of any good burning oil, free from impurities, will fill each torch with enough fuel for 24 hours service in any weather. Weight 5½ pounds.

IMPROVED BURNER

All TOLEDO TORCHES are now equipped with a burner which greatly improves its performance. No projecting parts to break. Insures constant flow of oil at right temperature. Correct length of wick projection always assured. Prevents back-slippage and loss of wick inside of torch. Interchangeable with all previous models. The secret of all-weather dependability.







THE TOLEDO TORCH "SPECIAL"

Same general features as the "STANDARD," self-righting, unbreakable, theft-proof, storm-proof, safe.

A much heavier torch than the "STANDARD," made of 15 gauge steel. Has a welded seam. Capacity three quarts, weight 6½ pounds. This torch is recommended for abnormally rough usage.

Ownership Nameplates

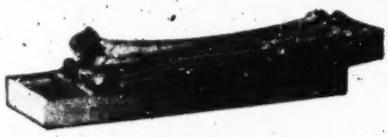
may be welded on all torches at the factory, at an additional cost of $1.25 per dozen.





REPLACEMENT WICKING

Same as original equipment. Proper quality, full length, one dozen per box.



Sig-nal-ite

NOT SELF-RIGHTING



This low priced torch is intended for service where it will not be subjected to the hazards of moving traffic. It is especially suitable for use by electric railways where it can be deposited between rails and similar positions. It is not enamelled like the TOLEDO TORCHES. You may color it to suit yourself. Capacity three quarts. Weight 2½ pounds.

PROCEEDINGS IN THE

UNITED STATES CIRCUIT COURT OF APPEALS

FOR THE SIXTH CIRCUIT

CAUSES ARGUED AND SUBMITTED

(November 9, 1937—Before: MOORMAN, SIMONS and ALLEN, JJ.)

These causes are argued by W. P. Bair for Appellants and by Wilber Owen for Appellee and are submitted to the Court.

DECREE—No. 7271

(Filed December 7, 1937)

Appeal from the District Court of the United States for the Northern District of Ohio.

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Northern District of Ohio, and was argued by counsel.

ON CONSIDERATION WHEREOF, It is now here ordered, adjudged and decreed by this Court that the decree of the said District Court in this cause be and the same is hereby reversed and the cause remanded with instructions to dismiss the bill for want of invention.

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DECREE—No. 7272

(Filed December 7, 1937)

Appeal from the District Court of the United States for the Northern District of Ohio.

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Northern District of Ohio, and was argued by counsel.

ON CONSIDERATION WHEREOF, It is now here ordered, adjudged and decreed by this Court that the decree of the said District Court in this cause be and the same is hereby reversed and the cause remanded with instructions to dismiss the bill for want of invention.

OPINION

(Filed December 7, 1937)

Before MOORMAN, SIMONS and ALLEN, Circuit Judges.

SIMONS, Circuit Judge. The Withrow and Close patent in suit, No. 1,732,708, issued October 22, 1929, relates to construction torches and truck flares for use as outdoor warning signals and adapted to emit luminescent flame protected from wind and rain. The appellants are dealers in flares competing with those made under the patent, and appeal from decrees sustaining its validity and granting relief for its infringement.

The only difference between a torch and a flare seems to be one of size. The former is intended for the contracting industry and is set out to guard street obstructions at night. A flare is for the use of trucks when they are temporarily halted at night upon the

road. The invention, if any there is, lies in the construction of the guarded burner.

The bomb-shaped excavation torch, weighted against upsetting, with flattened bottom and a wick receiving opening in its top, was already old when this court in the light of prior art denied validity to McCloskey patent 1,610,301, in 1929, *McCloskey* v. *Toledo Pressed Steel Co.*, 30 Fed. (2d) 12. The appellee had, however, built up a substantial business in the open flame bomb-shaped torches of the McCloskey type before the present patent was granted. Although it claimed for such torches capacity to burn in all kinds of weather, it now says that numerous complaints of their extinguishment by wind and rain led the present patentees to the long series of experiments and tests extending over a number of years which resulted in the burner and guard which is the subject matter of the patent in suit, that the device has successfully met the requirements of contractors and State Highway Commissions, has sold in large volume, has been the subject of license to several manufacturers, and has been copied without license by the manufacturer defending the present suits.

We see no patentable distinction in the many claims in suit, however they may be differentiated from each other, were the issue solely one of infringement. The elements of Claim 1, which relate to the guard or cap, require that it be disposed on the outer side of the torch body to enclose the outer end of the wick, that it have an imperforate upper wall, lateral flame openings, and air openings below the flame openings. Other claims variously describe these cap elements. Claim 2 recites the flame openings as adapted to emit luminescent flame, and designates the cap as a flame guard for the wick. Others speak of an outwardly extending flange in the region of the wick opening to which the cap is connected, and still others as having the bottom of the cap in heat conducting relation to the flange, or in heat transferring relation to the flange.

Stripped of variations in nomenclature, and in the ingeniously differentiated phrases of counsel in setting forth the claims, the invention is for a burner with a metal guard to protect the flame from air currents and rain. The art is full of illustration and description of metal guards for burners, typical of which are the patents to Almond, No. 193,796; Blake, No. 453,335;

Kahn, No. 1,755,527; Heston, No. 270,587, and Hathaway, No. 147,496. The challenge to their pertinence must be repelled. There is sufficient suggestion in a burner guard when it is found in one familiar contrivance to point the way to its use in another. We have often observed that where an art is a specialized development of an older art the offspring is entitled to the previously disclosed useful characteristics of the ancestral estate. *Dunham Co.* v. *Cobb,* 19 Fed. (2d) 328; *Page Steel & Wire Co.* v. *Smith Bros. Hardware Co.,* 64 Fed. (2d) 512. A mere change in environment is not patentable unless invention may be found in the concept of the adaptation. *Willett Mfg. Co.* v. *Root Spring Scraper Co.,* 55 Fed. (2d) 858 (C. C. A. 6). In *Lakewood Engineering Co.* v. *Walker,* 23 Fed. (2d) 623, invention was found in the adaption of an element from a wholly unrelated art where differences in size, weight, strength, purpose and manner of use were such that no effective suggestion could have been furnished by the old device. Even there the question was recognized as close, and we have indicated that beyond that we ought not to go. *Page Steel & Wire Co.* v. *Smith,* supra.

Once again support for validity is sought in demonstration of commercial success. We have seen that the plaintiff was already a successful manufacturer of open flame flares and torches before the alleged invention was made, extensively advertised as possessing the identical virtues of the device of the patent. Acceptance of licenses where royalty is relatively insignificant does not of itself establish patent validity, *Firestone Tire & Rubber Co.* v. *U. S. Rubber Co.,* 79 Fed. (2d) 948, since as against strong manufacturers competitors frequently find it more expedient to yield to the claims of a doubtful patent than to undertake the expense and trouble of patent litigation. There is here no substantial evidence of effort general to the industry to solve a problem which long defied it. The proof is limited to experiments of the patentees, and so far as it goes it serves to demonstrate lack of awareness of the teachings of the art rather than the inherent difficulties of the problem itself. They chose the long road to solution, and the patent law does not reward mere persistence, unassociated with original creative effort.

Decrees reversed. Causes remanded with instructions to dismiss the bills for want of invention.

PETITION FOR REHEARING

(Filed February 12, 1938)

IN THE

United States Circuit Court of Appeals

FOR THE SIXTH CIRCUIT

No. 7271

STANDARD PARTS, INC., *Defendant-Appellant,*

vs.

THE TOLEDO PRESSED STEEL CO., *Plaintiff-Appellee.*

No. 7272

HUEBNER SUPPLY COMPANY, *Defendant-Appellant,*

vs.

THE TOLEDO PRESSED STEEL CO., *Plaintiff-Appellee.*

PETITION FOR REHEARING

May It Please the Court:

We respectfully ask rehearing of this cause (with oral argument if it may be thought proper) not,—we must admit,—upon any distinctly new ground, but be-

cause we hope that the fundamental question may be further considered, as being properly dominated by a point of view not specifically urged in the briefs on file and not discussed in the opinion of the court.

THE STATE OF THE ART

The fundamental question obviously is, "In view of the existing burner art, did the patentees' changes amount to invention?" In other words, "Were their changes such as would probably have occurred to a man skilled in this art, if his attention had been drawn to the need which the changes first supplied?"

The court thought that when the need of protecting the McCloskey flare from wind and rain was observed, it would have been fairly natural, if not obvious, to apply to the McCloskey flare the shields of the burner art. If so, and if, so applied, with only obvious modifications, they would have served the purpose, the court's conclusions were of course correct.

The somewhat new point of view(*) which we now present is this: For the man who saw the need of this protection, the natural first thought would have been (a) to make the flame bigger and so more stable, or (b) to protect it by a shield. The first (a) was tried by extending the blazing part of the wick to be 1½ inches or more. This failed; the flame continued unstable. The second (b) being thought of, would be at once rejected because the shields would be so plainly useless, or worse, that it would be a waste of time to try to modify and adapt them.

(*)Entirely new, so far as express words go.

Remembering that the sole utility of the McCloskey flare was to present to the oncomer who needed warning a bright, strong flame, it may well enough be that to put over the top, to protect from the rain, some sort of a hood or mushroom top, would have been a natural thought. Perhaps this could be made so that it would not interfere very much with the burning of the flame, and since the warning was to be given more or less horizontally, a shield over the top would not interfere with the vision of the driver to be warned. As to a side shield, the situation was very different. The wind may blow on all sides and so a side windshield must go all the way around; and it apparently would have been the first (or second) thought of everyone—as it seems to have been in fact the first thought—that a side shield **could not** at the same time keep the wind from getting **in** from the outside and permit the light to come **out** from the inside. Ordinary material which would keep the wind **out** would keep the light **in**. The only material which would do both is glass, and glass chimneys were notoriously not only unsuitably fragile, but they were inefficient in a wind both because they would become covered with soot and, being open at the top, the flame would almost immediately blow out,—leaving for consideration only metals. Without much doubt, the ordinary mechanic would therefore have said, "The idea of putting a metal windshield around the McCloskey flame is foolish, because while the flame might be kept burning, it would do no good."

If this view is correct, it results that the patentees followed the normal thought of the skilled and intelligent mechanic when, seeing and appreciating the need,

they tried experiment after experiment to satisfy that need, instead of turning to the known art now said to be analogous. To come back eventually to the side shield and to succeed in modifying it so that, under the circumstances of its needed application, it would perform the paradoxical functions of excluding the wind and rain but not obstructing the useful vision, was the course which had seemed to be exactly the thing **not to do**, but to which they were eventually driven by failure to find any other way. To use the simile from the court's opinion, "They chose a long road to the solution," because they saw, on what the court now regards as a short and easy route, the sign "**No Road—Detour.**"

The cases are familiar which have held that when what the patentee eventually did was to abandon what seemed to be the obvious and adopt and perfect what seemed to be, or was believed to be, impracticable or forbidden, and thereby succeed,—that is strong, if not rather conclusive, evidence of the inventive character of what he did. Some cases are cited in the footnote.(*)

(*)The principle has been stated times without number, by many courts. Two of the latest restatements by District of Columbia tribunals are:

In **Re Delaney**, 62 F. (2d) 838, 840, the Court of Customs and Patent Appeals said:

> "It is our opinion that one skilled in the art, upon examining the references, would be directed away from appellant's composition rather than toward modifying the proportions therein set forth to produce appellant's composition."

In **Ex Parte Hecht**, 19 U. S. Pat. Q. 161, 163, the Board of Appeals said:

> "While it may be true as indicated by the examiner that to merely exercise the reasoning faculties with respect to well known properties of matter in working out desirable results may not involve invention; yet when one as by inspiration is led to reverse the natural order of things and to depart from the dictates of his reasoning faculties and by so doing produces a new, useful and unexpected result, he makes an invention."

But if, in spite of the natural rejection of the idea of using a side shield, they had turned away from vision signals and gone to the cook stove and other burner art for shields, what would they have found? The opinion of the court specifies those references which seemed most pertinent.

Before considering these, we note that the court referred to the **Land Roller** and **Road Scraper** cases as indicating the propriety of resort to these burners. In the **Land Roller** case we find the reference to the "ancestral estate"; in the **Road Scraper** case to the "environment."

These warning flares are in the direct line of descent from the Greek torch and the Roman lamp. The heater for the baby's milk (Almond) and the flash igniter for the cook stove (Kahn) are no part of this ancestral family. They are, at the best, rather remotely related,—not even **next** of kin.

In the **Road Scraper** case the court said:

> "It is true that where the availability of the old device to use in the new environment is not obvious either because of intrinsic differences in the quality of the operation to be performed, etc., * * * invention may be found in the mere concept of such availability to useful service in the new and different environment." (P. 859.)

In the instant case, as we view it, the invention was both "in the mere concept," and also taken beyond such mere concept, for it required essential modification. Clearly, there were "intrinsic differences in the quality of the operation to be performed"; the qualities were not merely different, they were antagonistic.

It should be noted also that heaters and torch flares, even if they have a family relationship, **operate by dif-**

ferent methods to produce different results. It should be noted also how the shield-flame relationship is reversed. In the old burner art cited by the court the shield is used to surround that flame which is to be protected. In the patentees' device in actual operation, the flames come out from the large openings in the cap and unite into one large flame which surrounds all the upper part of the cap or shield. In some instances at least of the earlier burner art, the shield surrounded and protected the useful flame; in the patentees' device, the shield protected only the source of the flame while the useful flame was outside the shield. This reversal of function typifies the lack of interrelationship between the burner art and the patented device.

We venture to ask now a little further attention by the court to these old burners, and we endeavor not merely to repeat what was said before, but to add a new thought,—in the hope that it may be enough to turn the scale. As to each of these references, before it can be held sufficient to indicate non-invention in the patent in suit, the double question must be asked, and answered affirmatively:

> "(a) Was it natural for the patentees to think of it when confronted by their problem; and
> (b) If so, did it, without more, furnish the solution which they reached?"

Turning now to these references for an answer to our double question:

Almond is a heater, not a lamp. Defendant's expert said (R. p. 109) that he had not built a model of Almond because he did not want a heater. Almond burns vapor

to create a blue flame. If there is any luminescent flame upon the tip of the wick, it cannot be seen, and it is intended to be negligible in amount. Almond says (second column, p. 242):

> "In other words, the flame is reduced to the bare possibility of existence, but not entirely stifled, and is thus utilized as a means of vaporizing all that part of the fuel which, were it not for the lack of draft referred to, would be directly ignited on the wick."

He then states that the vapors thus created are mingled with fresh air and so will produce a perfect heating flame,—obviously non-luminous. In his fourth claim he describes the space inside of his outer shield G as "arranged to constitute a combustion chamber for vapors and gases" which come out from the inner tube. But, however Almond is to be classified, he did not have any shield which was intended to, or could, prevent the wind from getting in but let the flame out, to be seen by one approaching. What seems to be the shield, in looking at his drawing, is the outer tube G. This is really a combustion flue. He says it is intended to direct the heat upward against whatever is held above by the brackets. The patentees did not take this shield (flue) or any modification of it and transfer it to the old torch. For that purpose it would be useless, because it would substantially shut off the vision of one approaching, so it could not serve as a warning, and, being a mere chimney, the flame would doubtless blow out as with any lamp chimney. Certainly the shield or tube G is no ancestor of the patentees' device; and, conceding that, defendant's counsel and expert have been ingenious

enough to find another shield in Almond,—though on looking at the complete device in use, or looking at the drawing of the patent (R. p. 241), we would never think of it. The drawing shown at the end of defendant's brief (which omits the real shield) is something that the patentees never had seen, and would not naturally find in the patent drawing. Almond himself disclaims this mutilation, for he says (p. 243) that without the tube G satisfactory results will not be obtained. But even if we accept this drawing (corrected as it should be as shown by plaintiff's brief opposite page 39), we do not find the patentees' shield in purpose, form or result. The **purpose** is to create heat and concentrate it and carry it up the flue rather than to create a visible signal flame. The **form** is such that the openings are too minute to permit a substantial body of flame to escape. Indeed, the substantial body of flame to be protected from the wind is formed outside of this cap and if not protected by the shield G would at once blow out,—thus demonstrating that the comparable part of this device is the outer tube G. In **result**, no visible flame or useful signal is produced and nothing that would withstand wind or rain. The "qualities of the operation to be performed" give us different problems of vapor mixtures, producing heat or light, wind protection, carbon or soot deposits, etc.

There is no proof that the structure of Almond,—either as shown in the patent or with the tube G as shown in defendant's drawing,—would be of any use as an outdoor flare. It is fairly apparent that under outdoor conditions it would not stay lighted efficiently unless the patent disclosure were modified by later knowledge; and

this was the opinion of the only witnesses who had practical experience (Rec. pp. 133, 137).(*)

Blake. Here again we have what is really (like the inner chamber in Almond) a vaporizing chamber and not a guard or shield to keep the wind out and let the light escape. There is no wick. The fluid permeates the absorbent material and is heated and reaches vaporizing temperature. Minute jets of vapor are shot horizontally out of the registering openings in the outside wall of the chamber and are ignited after they get outside the chamber. The device may be operated with a previously formed gas as well as by vaporizing liquid fuel. Whether the jets of flame would unite in one large flame, or would continue as separate jets, is not important: in either case the flame would doubtless be blown out at once by a high wind. Air inlets and flame outlets were not proportioned with any idea of maintenance in a strong wind. To apply this cap or shield to the McCloskey flare would require it to be substantially reorganized and then used to produce materially different results, not contemplated by Blake.

Kahn was not intended or adapted to produce and maintain a body of flame suitable for a permanent signal. It was a flash igniter. It involved a constantly burning pilot light which, when gas pressure was increased, would develop into horizontal jets of flame so as to ignite adjacent burners in a gas stove. The hood or cover was not needed to protect the jets of flame which were

(*)This was indeed the only evidence on the point. True, defendant's witness testified to the successful use of defendant's Exhibit G which he said was "a model of the Almond patent" (131); but by the testimony of defendant's expert Vandevanter, who produced this model Exhibit G, it appeared (p. 112) that it did not truly represent the Almond patent in controlling particulars.

projected momentarily outside the cap. It would of course protect the pilot light to some extent in the quiet atmosphere of the room where the stove was situated, but it would be useless in a wind. Nor was it intended or adapted to create and maintain a body of flame suitable for a signal. It served no such purpose. To apply this cap or hood to the old McCloskey flare would only put out the flame.

Heston. This again was a vapor burner and like Kahn was essentially a pilot light device. The part which might perhaps be superficially thought of as a shield or guard, serves no such function. It comprises two caps; one over and upon and adapted to revolve upon the other; there are holes in each, and by the revolution of the outer upon the inner, the registration between the holes is regulated. Thereby the size of the issuing gas jets is determined. Neither in construction nor function do these caps suggest the shield of the patent in suit.

Hathaway. This again is a vapor burner and the fuel is vaporized before ignition. It also makes a flame by minute horizontal radiating jets. The cap or cover seems not even remotely to suggest the patentees' cap. The lamp was of course not designed to be maintained in the wind. The cap has lips extending horizontally outward near the gas jets and so giving some measure of protection from slight drafts. The cap does not suggest the patentees' device either in form or function.

We do not go beyond the early art which the court specially mentioned, for the others come no closer, indeed, Almond was the one chiefly relied upon by defendant. As to all these references, answering our suggested double question, is it not rightly to be said both

that one seeking to develop in a kerosene burner of the wick feeding type a strong and permanent outdoor flame would not naturally turn to small blue flame heaters, or to gas or vapor burners, intended for indoor use, being kept from such resort by the **prima facie** impossibility of a metal shield which would obstruct the wind but not the vision, and because the "qualities of the operation to be performed" were so different; and also to be said that if the thought of such resort had been followed out the patentees would have found that no one of the vapor burners furnished a cap which could have been used upon the McCloskey flare to produce the flare of the patent in suit, without substantial reorganization?

Upon the trial defendant built up its case of non-invention by the supposition that one or another of the caps or shields of the references might be united with the old McCloskey flare to produce the flare of the patent in suit. The burden of proof was on defendant, and it would have been naturally expected that defendant would have built these combination structures and proved that they would work. Nothing of the kind was done. The proposed combinations were not made very clear until by the sketches at the end of defendant's brief in this court. We are informed that since the decision of this court elaborate and careful tests have been made with devices constructed precisely as shown in each of the figures of this sheet of drawings, and that each one of them has proved to be a complete failure in the respects in which the device of the patent in suit has been completely successful, that is, in producing a strong and effective luminous flame which will maintain itself for a long time against the otherwise destructive results of

wind, rain and carbon deposits. It is hoped that, at least, a further hearing may eventually be had, permitting the introduction of this evidence to demonstrate what is now only inference as a matter of opinion from observation of the patents and drawings; but which inference is believed to be even now sufficient in view of the rule as to the burden of proof.

PRIOR EFFORTS AND FAILURES FOLLOWED BY UNIVERSAL ACCEPTANCE OF THE PATENTED DEVICE

Upon such a record as this, proof of long standing need, of prior effort and failure and of complete success and universal acceptance of the patentees' device, is very commonly thought to be a sufficient demonstration of the presence of invention. We respectfully urge that plaintiff's proof upon this subject was sufficient to entitle it to the conclusion that there was invention. Here again, we are informed that material and persuasive evidence of prior effort and failure has been discovered recently under circumstances that sufficiently explain the lack of earlier discovery, and it is believed that this will justify giving plaintiff an opportunity to present this proof in the trial court; but upon the present record as it stands, we urge that the proof is sufficient.

We suggest that the opinion unduly minimizes the extent of the difficulties and user dissatisfaction pertaining to the old McCloskey form. It is true that plaintiff advertised its old torches as being very good and in its advertising put the soft pedal on the operating difficulties which eventually drove it off the market, when it was compared with something better; but there are few

manufacturers who do not offend in this way, and it can hardly be intended to say that such advertising satisfies the mind that there is no invention in an improvement which displaces the original.

The sheet metal open flame bomb torch of the McCloskey type, although it had precedessors, was the first thing of the kind that went into large commercial use, and this began in 1925-26. The only early competition was between this plaintiff and the McCloskey Company after they ceased joint relations. It can hardly be doubted that the difficulties, which the testimony shows, became almost at once apparent so that the need for better protection of the flame at once came into existence as an obvious need. Plaintiff's earliest competitor, other than McCloskey, was the Dietz Company, the largest manufacturer in the country of lanterns and similar things. During a period of two or three years the plaintiff was engaged in effort after effort, all unsuccessful, to meet this need, yet Dietz brought out an open flame torch in 1928. The need was so obvious that it is rightly to be presumed (though the present record does not expressly show it) that these competitors would have been trying as plaintiff was to satisfy the need. There is nothing to indicate that either of them, or anyone else, succeeded. No one thought of going indoors and trying to borrow something from heating burners; or if anyone thought of it, he did not succeed.

When plaintiff's improved device came on the market, it superseded everything else. It was copied by McCloskey and Dietz. Other manufacturers, who from time to time appeared, took licenses. Still others, who did not take licenses, copied the improvement. The

record justifies the conclusion that within a short time after the appearance of this improvement it took entire and exclusive possession of the market, and no one any more makes or sells the open flame torch or flare. Such a complete acceptance by the public and by all competitors of the improved and patented form of the device is unusual, and we feel justified in suggesting that it was not completely appreciated by the court.

CONSTRUCTION OF PATENT

In reaching the conclusion that the patent was invalid, the court gave it a very broad construction, disregarding any limitation expressed or inherent in the claims. We urge that quite another view is justified. Even if we were to acknowledge the shield of the patented device as the legitimate descendant of the heater burner shields, still it has been transformed by such size, spacing, arrangement and proportions of the openings for the admission of air and the emission of flame as to perform another and contrasting function in a different way. Quite surely, the height and diameter of the cap, the area of the lower air openings, the proportion of the cap cut away opposite the flame, all conduce to the luminosity of the flame, its permanence, and the absence of carbon deposits. True, these essential elements are not literally specified in the claims, but they must be read in, to the extent that will make the device operative in the manner described. The specification says (ls. 78-88, p. 1) that the air inlet ports are restricted so as to admit only the air necessary for combustion, all making a larger flame but decreasing oil and wick consumption. "Substantially as described" usually inheres in every claim,

to the extent necessary to make it interpreted by the specification.

There is another feature in which plaintiff's patent is prejudiced by assuming that the claimed invention is only of the very broad character stated in the opinion. This may be developed by observing the statements in the advertising literature of two infringing devices (R. pp. 197, 203) that flares precisely like the patented device operate really as kerosene carburetors. This is because the heat of the flame is by the cap and flange construction conducted back to the wick tube at its upper end and thus the oil is heated to the point where a large part of it, but not all, vaporizes before burning. These devices therefore are, like the patent, combined wick and vapor burners. Even if some of the claims should be construed as not limited so as to distinguish from the prior art, yet we find that claims 11 to 14 are limited to this heat conducting construction, and the specification clearly points out (R. p. 157, lines 68-78) that the device has this combined function. The use of a cap or shield adapted to promote this function and in connection with any apparatus which calls this combined function into existence is, we contend, entirely new. We think Almond is the only instance which defendant claims to be of this character and Almond is sufficiently distinguished by its discussion elsewhere.

Respectfully sumbitted,

OWEN & OWEN,
Solicitors for Plaintiff-Appellee.

ARTHUR C. DENISON,
WILBER OWEN,
Of Counsel.

16

CERTIFICATE

I hereby certify that in my opinion the foregoing petition is well founded in law, is based on the record and is not made for purposes of delay.

WILBER OWEN.

ORDER DENYING PETITION FOR REHEARING

(Filed March 16, 1938)

The petition for rehearing is hereby denied.

UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT

I, J. W. MENZIES, Clerk of the United States Circuit Court of Appeals for the Sixth Circuit, do hereby certify that the foregoing is a true and correct copy of the record and proceedings in the cases of *Standard Parts, Inc.* v. *Toledo Pressed Steel Company*, No. 7271, and *Huebner Supply Company* v. *Toledo Pressed Steel Company*, No. 7272, as the same remains upon the files and records of said United States Circuit Court of Appeals for the Sixth Circuit, and of the whole thereof

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the seal of said Court at the City of Cincinnati, Ohio, this 26th day of April, A. D. 1938.

J. W. MENZIES,
Clerk of the United States Circuit Court of Appeals for the Sixth Circuit.

(SEAL)

[304] [Stamp:] Supreme Court U. S., Office of the Clerk, Received Jun. 14, 1938.

IN THE SUPREME COURT OF THE UNITED STATES, OCTOBER TERM, 1937

No. —

THE TOLEDO PRESSED STEEL COMPANY, Petitioner,

v.

STANDARD PARTS, INC., Respondent

No. —

THE TOLEDO PRESSED STEEL COMPANY, Petitioner,

v.

HUEBNER SUPPLY COMPANY, Respondent

ORDER

On consideration of the application of counsel for Petitioner in the above-entitled causes, and good cause therefor having been shown, it is now here ordered that the time within which a petition for a writ of certiorari may be filed herein be, and the same is hereby, extended until July 1938.

J. C. McReynolds, Associate Justice of the Supreme Court of the United States.

(6470)

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SUPREME COURT OF THE UNITED STATES, OCTOBER TERM, 1

No. 166

ORDER ALLOWING CERTIORARI—Filed November 21, 193

On Petition for Writ of Certiorari to the United St
Circuit Court of Appeals for the Sixth Circuit

A petition for rehearing having been filed in this
upon the denial of a petition for writ of certiorari;

Upon consideration thereof, it is ordered by this C
that the said petition be, and the same is hereby, grante

And it is further ordered that the order denying ce
orari be, and the same is hereby, vacated; and that the p
tion for writ of certiorari herein be, and the same is here
granted.

And it is further ordered that the duly certified copy
the transcript of the proceedings below which accompan
the petition shall be treated as though filed in response
such writ.

SUPREME COURT OF THE UNITED STATES, OCTOBER TERM, 1

No. 167

ORDER ALLOWING CERTIORARI—Filed November 21, 193

On Petition for Writ of Certiorari to the United St
Circuit Court of Appeals for the Sixth Circuit

A petition for rehearing having been filed in this
upon the denial of a petition for writ of certiorari;

Upon consideration thereof, it is ordered by this C
that the said petition be, and the same is hereby, grante

And it is further ordered that the order denying ce
orari be, and the same is hereby, vacated; and that the p
tion for writ of certiorari herein be, and the same is here
granted.

And it is further ordered that the duly certified copy
the transcript of the proceedings below which accompan
the petition shall be treated as though filed in respons
such writ.

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1938

No. 603

MONTGOMERY WARD & COMPANY, INC.,
PETITIONER,

vs.

THE TOLEDO PRESSED STEEL COMPANY

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

PETITION FOR CERTIORARI FILED JANUARY 19, 1939.

CERTIORARI GRANTED FEBRUARY 6, 1939.

United States Circuit Court of Appeals

FOR THE SECOND CIRCUIT

No. .....

THE TOLEDO PRESSED STEEL COMPANY,
A CORPORATION,

Plaintiff-Appellant,

vs.

MONTGOMERY WARD & COMPANY, INC.,
A CORPORATION,

Defendant-Appellee.

APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF NEW YORK.

TRANSCRIPT OF RECORD

DARBY & DARBY,
Solicitors for Appellant
SAMUEL E. DARBY, JR.
WILBER OWEN
Of Counsel

ANTHONY WILLIAM DELLER,
Solicitor for Appellee
CARL WISNER, JR.
Of Counsel

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In the United States District Court

EASTERN DISTRICT OF NEW YORK

1

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff*,

vs.

MONTGOMERY WARD & CO., INC., A CORPORATION, *Defendant*.

In Equity No. 8417

Bill of Complaint

(Filed November 16, 1937)

2 TO THE HONORABLE THE JUDGES OF THE DISTRICT COURT OF THE UNITED STATES WITHIN AND FOR THE EASTERN DISTRICT OF NEW YORK.

Plaintiff, THE TOLEDO PRESSED STEEL COMPANY, brings this bill of complaint against MONTGOMERY, WARD & COMPANY, INC., defendant, and for its cause of action states as follows:

1. Plaintiff is a corporation duly organized and existing under and by virtue of the laws of the State of Ohio, and is a citizen of Ohio, having its principal office and place of business at Toledo, in said State.

3 2. Defendant, Montgomery, Ward & Company, Inc., is a corporation organized and existing under and by virtue of the laws of the State of Illinois, is a citizen of Illinois and maintains a regular and established place of business in the City of Jamaica in the Eastern District of New York, where the acts of infringement hereinafter complained of were committed.

3. This is a suit in equity arising under the patent laws of the United States, for infringement of United States Letters Patent No. 1,732,708, issued to plaintiff on October 22, 1929.

4 4. Heretofore and before the 25th day of December, 1928, Joseph E. Withrow and Lyman W. Close, both citizens of the United States, residing at Toledo in the State of Ohio, were the original, first and joint inventors of a certain new and useful Burner, not known or used by others in this country before their invention or discovery thereof, not patented or described in any Letters Patent or printed publication in this or any foreign country before their invention or discovery thereof or more than two years prior to their application for the hereinafter mentioned Letters Patent, not in
5 public use or on sale in this country for more than two years prior to the date of their said application for Letters Patent in the United States, not patented in any foreign country upon an application filed more than twelve months prior to their said application for Letters Patent, and not abandoned to the public.

5. On or about December 26th, 1928, the said Joseph E. Withrow and Lyman W. Close, being as aforesaid the original, first and joint inventors of said Burner, made due application to the Commissioner of Patents for Letters Patent of the
6 United States for said invention, and by an instrument in writing, duly executed and delivered by them, assigned and transferred the entire right, title and interest in and to said invention and Letters Patent to plaintiff herein and authorized and requested the Commissioner of Patents to issue the Letters Patent for said invention to said assignee, and having in all respects duly complied with the conditions and requirements of the Acts of Congress in such cases made and provided, on the 22nd day of October, 1929, Letters Patent of the United States for said invention, bearing No.

1,732,708, signed, sealed and executed in due form 7
of law, were issued and delivered over to plaintiff, as the assignee of said Joseph E. Withrow and Lyman W. Close, whereby there was secured unto plaintiff and its successors and assigns for the term of seventeen (17) years from said 22nd day of October, 1929, the sole and exclusive right of making, using and selling and of granting to others the right to make, use and sell devices embodying the said invention, all as by said Letters Patent, or a duly authenticated copy thereof, here in court to be produced and shown to Your Honors, will more fully and at large appear, a copy of said Let- 8
ters Patent, marked "Plaintiff's Exhibit 1," being attached hereto and made a part hereof.

6. Plaintiff, since the issuance of said Letters Patent, has invested large sums of money and gone to great trouble and expense in and about said invention for the purpose of introducing the same into general use and making it profitable to itself and useful to the public; has itself made and sold large numbers of construction torches and truck flares embodying the said invention and has granted licenses thereunder to a number of manufacturers, including Doray Lamp Company, of Chi- 9
cago, Illinois; K-D Lamp Company, of Cincinnati, Ohio; R. E. Dietz Company, of New York, N. Y., Shanklin Manufacturing Company, of Springfield, Illinois, and Embury Manufacturing Company, of Warsaw, New York, each of which licenses has recognized the validity of said Letters Patent, and has manufactured and sold construction torches and/or truck flares embodying the invention of said Letters Patent and paid substantial royalties to plaintiff thereunder. Plaintiff and its said licensees have been and now are ready and able to supply the

10 entire demand of the trade and of the public for torches and flares embodying the invention of said Letters Patent.

7. Plaintiff has caused notice of its said Letters Patent to be given to the public by permanently stamping "Patent No. 1,732,708" on each and every embodiment of said invention sold by it since the issuance of said Letters Patent and has required its said licensees to similarly mark all embodiments of said invention manufactured and sold by them under their said licenses, which requirement has been fully complied with by said licensees,
11 as plaintiff is informed and believes.

8. Notwithstanding the ability of plaintiff and its said licensees to supply the requirements of the trade and the public with construction torches and flares embodying the invention of said Letters Patent, other manufacturers have disregarded plaintiff's rights under said Letters Patent and have, without right or authority, manufactured and sold construction torches and flares in infringement thereof. In January, 1934, plaintiff brought suits in the United States District Court for the Northern District of Ohio, Western Division
12 against dealers who were selling infringing truck flares which were manufactured by The Bolser Corporation, of Des Moines, Iowa, and Kari-Keen Manufacturing Company, of Sioux City, Iowa, which manufacturers openly assumed and conducted the defense of said cases. Said suits came on for hearing in said court before His Honor Judge George P. Hahn, in May, 1935, who entered a decree finding plaintiff's said patent to be valid and infringed by the two devices involved in said suits. Plaintiff having waived an accounting against said dealers who were the nominal de-

fendants of record in said causes, final decrees 13
were entered therein on the 29th day of June, 1935, finding said patent to be valid and defendants' said structures to infringe a number of the claims thereof.

9. Prior to the commencement of this suit and since the entry of the decree in the causes above referred to, defendant herein, Montgomery, Ward & Company, Inc., having had notice of plaintiff's patent through the marking of devices made thereunder by plaintiff and its said licensees and well knowing plaintiff's rights in the premises, infringed and still is infringing the said Letters 14
Patent by selling at its regular and established place of business at Jamaica, within the Eastern District of New York, and elsewhere throughout the United States, truck flares embodying the invention disclosed, described and claimed in said Letters Patent, without plaintiff's license or consent and in violation of plaintiff's rights under said Letters Patent, and is threatening to continue its said acts of infringement, which acts of defendant have the effect of inducing others to infringe said Letters Patent and of depriving plaintiff of profits to which it is entitled as the owner of said Letters 15
Patent and of causing great and irreparable damage and injury to plaintiff.

10. The devices so sold by defendant in infringement of plaintiff's said Letters Patent have "Mfd. By Anthes Force Oiler Co., Ft. Madison, Ia.," permanently stamped in the metal thereof, and plaintiff is informed and believes and therefore avers that the devices which have been sold and are being sold by defendant in infringement of said Letters Patent were manufactured by said Anthes Force Oiler Company, which company was

16 a former licensee under plaintiff's said Letters Patent, under which license it paid royalties to plaintiff on truck flares of a slightly different construction than those being sold by defendant herein. Said Anthes Force Oiler Company having discontinued the payment of royalties to plaintiff on the plea that its truck flares constructed like those complained of herein do not infringe plaintiff's said Letters Patent, the License to it has been terminated and it is invited to appear and assume the defense of this cause. The truck flares on which said Anthes Force Oiler Company paid
17 royalties to plaintiff under said Letters Patent are illustrated in the advertisement of said company attached hereto and marked "Plaintiff's Exhibit 2" and its truck flares which are being sold by defendant herein are illustrated in its advertisement attached hereto and marked "Plaintiff's Exhibit No. 3." The truck flares charged herein to infringe closely resemble the construction of the Bolser and Kari-Keen truck flares held to infringe as aforesaid, the only difference between the burners thereof being that in the Bolser and Kari-Keen burners held by this court to infringe the air inlet openings
18 were located in the side of the flame guard at points below the flame openings, whereas in the truck flares being sold by defendant and charged herein to infringe the air inlet openings are located in the flange portion of the flame guard which projects from the wick tube and supports the removable portion of the flame guard.

11. Plaintiff is informed and believes and therefore avers that defendant, Montgomery, Ward & Company, Inc., is prepared to and will, unless enjoined by this Honorable Court, continue its said infringement and cause further irreparable dam-

age and injury to plaintiff for which it will have 19
no adequate remedy at law.

WHEREFORE, plaintiff prays:

1. That said Letters Patent No. 1,732,708 may be decreed to be good and valid in law, and that plaintiff's title thereto may be confirmed.

2. That defendant may be decreed to have infringed said Letters Patent by the sale of truck flares manufactured by Anthes Force Oiler Company, of Fort Madison, Iowa, and illustrated in Plaintiff's Exhibit 3 attached hereto.

3. That a preliminary injunction pending this suit and a perpetual injunction at final hearing 20
may be issued against defendant restraining and enjoining it, its officers, agents, attorneys, servants, workmen, employees, privies and confederates from in any way infringing said Letters Patent or any claim thereof, directly or indirectly, and from contributing to the infringement thereof by others.

4. That defendant may be decreed to account for and pay over to plaintiff all gains and profits which have accrued to defendant and all damages which the plaintiff has suffered by reason of defendant's infringements of said Letters Patent, 21
that this cause may be referred to a Master to take and report to the Court an account of such profits and damages, that the Master may be given all the powers conferred upon masters by law and the rules of equity, and that the Court may increase said damages in its discretion as provided by law.

5. That defendant may be decreed to pay the costs, charges and disbursements of this suit and that plaintiff may have such other and further relief as the circumstances and equity of the case may require.

May it please Your Honors to issue a writ of subpoena under the seal of this Honorable Court, directed to said defendant, commanding it at a certain day and under a certain penalty to be and appear before this Honorable Court, then and there to answer this bill of complaint (but not under oath, an answer under oath being expressly waived), and to stand to and abide such further orders, directions and decrees as to Your Honors shall seem meet in the premises.

THE TOLEDO PRESSED STEEL COMPANY,
Plaintiff,

By J. E. WITHROW,
President.

DARBY & DARBY,
Solicitors and Counsel for Plaintiff,
OWEN & OWEN,
Nicholas Bldg.,
Toledo, Ohio,
of Counsel.

State of Ohio, County of Lucas, ss.:

On this 15th day of November, 1937, before me personally appeared J. E. Withrow, who being by me first duly sworn, deposes and says that he is President of The Toledo Pressed Steel Company, the plaintiff herein; that he has read the foregoing bill of complaint by him subscribed, and knows the contents thereof, and that the same is true to his own knowledge except as to matters stated to be alleged on information and belief, and as to those matters he believes it to be true.

MARY E. DUKES,
Notary Public, Lucas County, Ohio.
(Notary Seal)

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK.

THE TOLEDO PRESSED STEEL COMPANY,
A CORPORATION,
Plaintiff,
vs.
MONTGOMERY WARD & CO., INC.,
A CORPORATION,
Defendant.

In Equity
No. E-8417

Answer of Defendant
(Filed Dec. 22, 1937)

Now comes MONTGOMERY WARD & CO., INC., an Illinois corporation, defendant in the above entitled cause, and files this its answer to the bill of complaint heretofore filed herein and shows the following:

1. Answering paragraph numbered "1" of said bill of complaint, defendant states that it is not informed as to the corporate status of the plaintiff and the location of its office and prays strict proof thereof.

2. Answering paragraph numbered "2," this defendant admits that it is a corporation organized and existing under the laws of the State of Illinois, and that it is a citizen of Illinois and maintains a place of business in the City of Jamaica in the Eastern District of New York, but denies that any acts of infringement of said patent were committed by it in the said Eastern District of New York or at any other place.

3. Answering paragraph numbered "3," this defendant admits that this is a suit in equity arising under the patent laws of the United States but denies any act of infringement of said letters patent.

4. Answering paragraph numbered "4," this defendant denies that the said Joseph E. Withrow and the said Lyman W. Close, prior to December 26, 1928, were the original, first and joint inventors of a certain new and useful burner, and alleges that all of the claims of said patent were and are void for want of novelty, and are further void as being for aggregations and not for patentable combinations; and this defendant alleges that the invention claimed by said Withrow and said Close in said patent application was well known in the art and public property more than two years prior to December 26, 1928, the pertinent references thereto being more specifically set forth in paragraph "8" hereof.

5. Answering paragraph numbered "5," this defendant denies that said Withrow and said Close were the original, first and joint inventors of the burner described in said application, but admits the making of the application for the letters patent as alleged and admits that letters patent were issued to said plaintiff as alleged in said paragraph numbered "5," but denies that said letters patent have any force or validity, and alleges that all claims therein were and are void for want of novelty and invention, as is more specifically set forth in paragraph "8" hereof, and that said claims are further void as being for aggregations and not for patentable combinations.

6. Answering paragraph numbered "6," this defendant states that it has no knowledge, information or belief as to the expenditures or efforts of the plaintiff in and about introducing the device described in said letters patent into general use, and in and about making it profitable to the plaintiff and useful to the public; this defendant further

states that it has no knowledge, information or be- 31
lief as to the numbers of construction torches and truck flares sold by the plaintiff or of the granting of licenses by the plaintiff to other manufacturers under said letters patent, or as to the payment of royalties to the licensor as alleged; this defendant further answering states that it has no knowledge, information or belief as to whether or not said plaintiff and its licensees are ready and able to supply the entire demand of the trade and the public for torches and flares, and prays strict proof of all of the allegations of said paragraph numbered "6." 32

7. Answering paragraph numbered "7," this defendant states that it has no knowledge, information nor belief of the allegations of said paragraph and prays strict proof thereof.

8. Answering paragraph numbered "8," this defendant states that it has no knowledge of the ability of the plaintiff to supply the trade with construction torches, nor of the claimed invasions of plaintiff's alleged patent claims by other manufacturers, nor of the bringing of said suits by plaintiff against dealers, nor of the said decree for said plaintiff in said causes, nor of the issues or claims 33
alleged to be infringed, nor of the structures of the devices decreed to infringe said letters patent, and demands strict proof thereof.

Further answering paragraph numbered "8," this defendant states that it was not a party to said suits nor privy thereto; that it took no part in the defense of said suits, and that it was not in privity with any defendant thereto, and had no notice or knowledge of the bringing of said suits or the prosecution thereof nor of the entry of any decrees therein.

34 Further answering paragraph numbered "8," this defendant states that it is now informed and believes and on such information and belief charges the fact to be that on the trial of said suits the defendants therein did not offer in evidence the pertinent prior art, nor did the court consider or have before it the pertinent prior art bearing on the validity of said letters patent; that from such pertinent prior art it must have appeared to the court that the claims of said patent were and are void for want of novelty; that the pertinent prior art not before the court in said causes now ready to
35 be shown by this defendant is shown in the British patents to

Argand—No. 1425 of July 3, 1784,

Salsbury—No. 16,524 of September 3, 1895,

and in the United States patents to

Rutz—No. 1,101,146 of June 23, 1914,

VanLiew et al.—No. 941,897 of November 30, 1909,

Warren—No. 783,339 of February 21, 1905,

and in the Russian patent to

Malcov—No. 1163 of July 9, 1968,

duly authenticated copies whereof will be produced on the hearing of this cause.

36 This defendant further answering paragraph numbered "8," alleges that the pertinent prior art shows a device somewhat similar to the device disclosed in the aforesaid Letters Patent to Rutz, No. 1,101,146, of June 23, 1914, manufactured by the Milwaukee Gas Specialty Company of Milwaukee, Wisconsin, and sold by that company in large numbers throughout the United States from approximately the year 1914 down to the present date, a specimen of which said device this defendant is ready to produce in open court on the hearing of this cause; and further in view of a device, said to

be of ancient Chinese manufacture, purchased by 37
the General Electric Company from a dealer on or about May 7, 1918, and on public display in its museum at Nela Park, Cleveland, Ohio, for many years thereafter, a photograph of which said device will be produced upon the hearing of this cause; and this defendant further alleges that the claims of said letters patent cover aggregations of well known elements, and are not for patentable combinations, and that all of the elements in the structure described in said letters patent or exemplified by said device were well known in the art for more than ten years prior to December 26, 38
1928.

And this defendant further avers that the elements in the structure described in said letters patent in suit or exemplified in said device were and are disclosed in the following publications, all of which were made public more than two years prior to December 26, 1928:

Histoire du Luminaire depuis l'epoque Romaine jusqu'a XIXe Siecle by J. R. d'Allemagne, published by Alphonse Picard, Paris, 1891, (John Crerar Library, Chicago, Call No. L 628.9 P 100), particularly the descriptions and illustra- 39
tions on pp. 86-90, 154-5, and 272-3, and Plates 3, 6, 19, 20, and 29.

Das Beleuchtungswesen by Ladislaus von Benesch, published by Anton Schroll & Co., Vienna, 1908 (John Crerar Library, Chicago, Call No. A 628.9 Q 500) and particularly Fig. 113 on Plate 48.

Ancient and Modern Lighthouses by D. P. Heap, published by Ticknor & Co., Boston, 1889 (John Crerar Library, Chicago, Call No. 627.9 O 800) pp. 12-14 and Plates 2 and 3.

40 *Lighthouses and Lightships* by W. H. Davenport Adams, published by Chas. Scribner & Co., New York, 1870 (John Crerar Library, Chicago, Call No. 627.9 N 100) illustration on p. 15.

British Lighthouses by J. Saxby Wryde, published by T. Fisher Unwin, London, 1913 (John Crerar Library, Chicago, Call No. 656.9 R 307) illustration opposite p. 27.

Artificial Light by M. Luckiesh, 1920 (John Crerar Library, Chicago, Call No. 628.9 G 001) illustration opposite p. 56.

Further answering paragraph numbered "8" of
41 said bill of complaint, this defendant states that the alleged invention described in said patent in suit was described in a printed publication more than two years before the filing of the application on said patent in the publication in 1856 at London, England, of the specification of British patent to Ami Argand, No. 1425 of July 3, 1784.

Further answering paragraph numbered "8" this defendant avers that the devices of defendants in said causes were and are substantially different from the complained of devices sold by this defendant; that the said complained of devices sold by
42 this defendant were and are not made in accordance with any of the claims in said patent; that said adjudication of said suits has no bearing on the issues herein by reason of the entirely different structure of the alleged infringing devices from that of the structures before the court in said suits.

Further answering paragraph numbered "8," defendant states that it is informed and believes and on the basis of such information and belief charges the fact to be that said decrees of the District Court of the Northern District of Ohio, Western Division, mentioned in said bill of complaint

and alleged to be an adjudication of the validity of 43
said Withrow and Close patent in suit were entered on the theory by the District Court which entered said decrees that the substance of the invention of said Withrow and Close patent in suit was the protection of the flame at its source; that it was erroneously held by the District Court in said causes that the prior art patents pleaded and relied upon by the defendants in said causes as showing anticipation, namely, United States patents to:

Almond No. 193,796 of August 7, 1877,
Blake No. 453,335 of June 2, 1891,
Kahn No. 1,175,527 of March 14, 1916, 44
Heston No. 270,587 of January 16, 1883,
Hathaway No. 147,496 of February 17, 1874,

did not anticipate the flame guard of said Withrow and Close patent in suit and said District Court held said Withrow and Close patent in suit valid over said prior art as disclosed in said patents.

And further answering paragraph numbered "8" defendant states that it is informed and believes and on the basis of such information and belief charges the fact to be that defendants in said causes appealed said decrees of the District Court for the Northern District of Ohio, Western Divi- 45
sion, relied upon herein as prior adjudication of said Withrow and Close patent in suit to the Circuit Court of Appeals for the Sixth Circuit; that a hearing on said appeal was had; that on or about December 7, 1937, the said Circuit Court of Appeals for the Sixth Circuit filed an opinion in said causes in which it was held that said Withrow and Close patent in suit was void for want of invention, on the ground that said patents last herein mentioned anticipated the said Withrow and Close patent in suit, and for greater certainty this de-

46 fendant attaches hereto a true copy of said opinion of said United States Circuit Court of Appeals for the Sixth Circuit in said causes as Exhibit "A" and by reference makes the same a part of this answer; and this defendant further states that the said Withrow and Close patent in suit is void by reason of having been anticipated by the following United States patents to

Almond No. 193,796 of August 7, 1877,
Blake No. 453,335 of June 2, 1891,
Kahn No. 1,175,527 of March 14, 1916,
Heston No. 270,587 of January 16, 1883,

47 Hathaway No. 147,496 of February 17, 1874,

which show the invalidity of said patent to Withrow and Close herein sued on.

9. Answering paragraph numbered "9," this defendant denies the allegation of notice of plaintiff's patent and of its alleged said licenses; denies infringing the letters patent within the Eastern District of New York, or at any other place; denies that it sells or has sold any truck flares embodying the inventions disclosed in said letters patent; denies that it has injured plaintiff in any manner; and alleges that the said plaintiff's patent is void for

48 want of novelty and invention; that even if the claims of said patent can be held to be valid for any purpose, the complained of truck flares sold by defendant do not include within their structure any of the claims of said patent.

10. Answering paragraph numbered "10" of said bill of complaint, defendant admits that it has sold truck flares from its said place of business marked "Mfd. by Anthes Force Oiler Co., Ft. Madison, Ia.," and admits that it purchased said truck flares from the said Anthes Force Oiler Company, but states that it has no information or knowledge

by whom said truck flares were manufactured or as to the present or former relationship of said Anthes Force Oiler Company with plaintiff. 49

Further answering paragraph numbered "10" defendant denies that the truck flares charged herein to infringe "closely resemble the construction of Bolser and Kari-Keen truck flares held to infringe," and this defendant states that subsequent to the filing of the bill of complaint herein the decrees relied on by the plaintiff were reversed by a decision of the Circuit Court of Appeals for the Sixth Circuit as aforesaid, and this defendant denies that the said truck flares sold by defendant 50 infringe in their structure and operation any of the claims of plaintiff's said patent.

11. Answering paragraph numbered "11" of said bill of complaint, defendant denies that it has damaged or injured or does or will damage or injure plaintiff by the sale of the complained of truck flares, and denies that plaintiff has shown or stated any facts which entitle it to the issuance of any injunctional or other relief by this court enjoining or restraining this defendant in any way from selling the complained of truck flares, and denies that plaintiff has shown any facts entitling it to any of 51 the relief against this defendant by reason of its sale of the complained of truck flares.

This defendant further avers that the complained of truck flares now being sold by it are based in their structure and theory of operation upon the luminescent flare, disclosed in the prior art in the British patent to Henry Salsbury No. 16,524, of the year 1895, in the Russian patent to Malcov No. 1163 of the year 1868, and in numerous prior publications showing luminescent flares protected at the flame source, in combination with a flame guard,

52 as disclosed in United States Letters Patent to A. O. Rutz, No. 1,101,146, issued June 23, 1914, and manufactured and sold by the Milwaukee Gas Specialty Company of Milwaukee, Wisconsin, for more than ten years prior to December 26, 1928, and defendant avers that the aforementioned structures are in the public domain and available for the use of any person who so desires.

WHEREFORE, this defendant denies that the plaintiff is entitled to any of the relief prayed in its bill of complaint and prays that the bill may be dismissed at plaintiff's costs.

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Narrative Statement of the Evidence

Brooklyn, New York, March 8, 1938.

Before:

HONORABLE GROVER M. MOSCOWITZ,
District Judge.

APPEARANCES:

54 DARBY & DARBY, Solicitors for the Plaintiff. SAMUEL E. DARBY, JR., WILBER OWEN, Of Counsel.
ANTHONY WILLIAM DELLER, Solicitor for the Defendant. CARL V. WISNER, JR., Of Counsel.

PLAINTIFF'S CASE

The plaintiff offered in evidence the following:
Deposition of Philip A. Kerwin.
Exhibit 1, Copy of patent in suit, Withrow and Close No. 1,732,708.
Exhibit 2, Photostat of advertisement of Anthes

Force Oiler Company showing Anthes first flare. 55

Exhibit 3, Photostat of advertisement of Anthes Force Oiler Company representing device on which Anthes Company refused to pay royalty.

Exhibit 4, Circular of Toledo truck flare.

Exhibit 5, Direction sheet of plaintiff's truck flare.

Exhibit 6, Certificate of approval of defendant's flare by Electrical Testing Laboratories of New York.

Thereupon, the plaintiff called as a witness JOSEPH E. WITHROW, who, being sworn, testified: 56

Direct Examination by Mr. Owen:

Mr. Withrow: My name is Joseph E. Withrow. I am one of the patentees of the patent in suit. I have been connected with the plaintiff since 1926. I am now president of the plaintiff company; for the first few months, I think, I had the position of treasurer. When I first became connected with the plaintiff they were manufacturing the open flame McCloskey torch. Later on that same year, we went into production of our own torch, which was 57 an open flame torch.

This torch which you show me is one of the open flame torches manufactured by us at that time.

Mr. Owen: Before going further, Your Honor, I should like to offer in evidence a blueprint produced by the witness Kerwin, in his deposition, as a plaintiff's exhibit.

(The blueprint was received in evidence and marked Plaintiff's Exhibit 7.)

I offer in evidence a photograph which the witness Kerwin identified.

58 (The photograph was received in evidence and marked Plaintiff's Exhibit 8.)

Mr. Owen: I offer a later blueprint produced by the witness Kerwin in his deposition, as a plaintiff's exhibit.

(The blueprint was received in evidence and marked Plaintiff's Exhibit 9.)

Mr. Owen: I now offer this open flame torch which the present witness has just identified.

(The same was received in evidence and marked Plaintiff's Exhibit 10.)

The Witness: This is one of our circulars illus-
59 trating this open flame torch.

Mr. Owen: I offer this circular in evidence.

(The circular was received in evidence and marked Plaintiff's Exhibit 11.)

The Witness: That circular refers to a patent dated January 11, 1927, on a method of fastening the counterweight on the bottom of the torch. That is a patent for an invention of our Mr. Close. He is vice-president of our company and joint patentee with me in the patent in suit.

Mr. Owen: I offer this copy of the patent in evidence.

60 (The copy of patent was received in evidence and marked Plaintiff's Exhibit 12.)

The Witness: The drawing of that patent represents the construction of the open flame torch which has been offered as Plaintiff's Exhibit 10 here. In 1926, we sold 1,121 of those torches. In 1927, we sold 26,630. In 1928, up to July the 15th, we sold 19,689. On or about July the 15th is when we changed the burner to what we called our improved burner. That improved burner is represented by this torch which you now show me.

Mr. Owen: I offer in evidence this torch

with the improved burner just identified by the witness. 61

(The same was received in evidence and marked Plaintiff's Exhibit 13.)

The Witness: The principal purchasers of torches like these two that I have produced were contractors and state highways. Those torches did not give satisfactory service for their uses. We received many letters objecting to them.

Mr. Owen: Now in the record of the Ohio case, Your Honor, the witness read from a large number of those letters.

The Court: Well, both sides seem to agree 62
that they ought to have a cap on. I assume that you thought it was desirable, and an improvement over the old method.

Mr. Wisner: It makes the device more efficacious against strong winds, Your Honor.

The Court: That is what you are trying to prove, isn't it, Mr. Owen?

The Witness: We recommended to our customers that the wick be extended an inch and a half on these open flame torches. That recommendation was made by means of a yellow tag that we fastened to the handle of each torch. 63

Mr. Owen: This tag, Your Honor, reads "Toledo Torch. The normal length of exposed wick is about one and one-half inches. Extend wick further for heavy weather conditions."

I now offer the tag in evidence.

(The tag was received in evidence and marked Plaintiff's Exhibit 14.)

The Witness: After we had produced the improved open flame torch, like Plaintiff's Exhibit 13, we continued to receive objections to its perform-

64 ance. The objections were that they would be extinguished in extremely heavy winds and rains.

The Court: That is not in dispute, is it?

Mr. Wisner: I assume that they got a lot of letters, Your Honor.

The Court: I mean that is not disputed as a practical thing.

Mr. Wisner: Occasionally they went out, yes.

The Witness: We continued our experiments in our efforts to overcome the objections to our open flame torches. We were not satisfied with the
65 burner, and we continued to experiment in an endeavor to improve it. We thought we had made a definite step forward in the matter of the improved burner when we started with Exhibit 13. Using that burner as a base, we started experimenting with structures placed on top of that burner and around the wick. Using that burner, we experimented by placing structures around the wick on the edge of that flat surface. We built those structures and we tried them out on that burner. We tested them comparatively. We would take and build a structure—as a matter of fact, the first
66 structure we built was compared with that one (indicating), and if that structure was better than what we had before, we would discard the poorer one, take the better one as a model and continue experimenting, always using the best as a model. These experiments continued several months. In fact, it was up until the early winter of 1928. Mr. Close worked with me on those experiments.

I cannot produce any of the experimental devices which we made and tested in that time. They were placed in a store room, in a box in the factory at Toledo, among other things which were not in com-

mon use. In July of 1929, we moved from those 67
quarters to a new location and somewhere in the moving and cleaning out, the models disappeared. We searched for them but we have not been able to find them. I can produce sketches or drawings of some of those experimental structures. Mr. Close made the sketches just prior to our case in Toledo in 1935. The old models—we had to make them up from memory. We consulted together and refreshed each other's mind as to what was done and we made those sketches which are remembrances of some of the models.

Mr. Owen: I offer these sketches in evidence 68
as one exhibit.

(The sketches were received in evidence and marked Plaintiff's Exhibits 15 to 15-I, inclusive.)

The Witness: I have an advertisement showing the construction of the torch, Plaintiff's Exhibit 13.

Mr. Owen: I offer this in evidence.

(The circular was received in evidence and marked Plaintiff's Exhibit 16.)

The Witness: As a result of those experiments, we produced this torch which is now shown me. 69
That is the torch of the patent in suit.

Mr. Owen: I offer that in evidence.

(The same was received in evidence and marked Plaintiff's Exhibit 17.)

The Witness: In making these experiments, to overcome the objections to the open flame torch, there were very definite limitations with reference to fuel and other conditions under which we were working. The fuel had to be kerosene, being a liquid fuel, gasolene was a dangerous thing to place in the positions where these torches were to be

70 used—they were close to traffic and other buildings, and often children played around them.

The burner itself must necessarily be of a simple construction for it to be handled by the ordinary laborer on street jobs. Many of the torches had to be put out at night around constructions, and it would not do to have too fine an adjustment on them. They had to be made to be put out quickly. Both of these conditions called for a wick burner. The burner itself had to be of a rugged and compact nature. The torches were often hit by passing traffic and rolled over, and it was only a rugged
71 structure that would stand up. They had to be of a compact nature, because the weight of the burner was in a location where it was a disadvantage, particularly in the construction torch with the weight in the bottom. The burner had to be counterweighted, and the more weight there was in the burner, the more weight you had to have in the bottom to give it stability. Of course, with the truck torches, it was desirable to have the equilibrium stable too.

Mr. Owen: I offer this paper in evidence.

(The same was received in evidence and
72 marked Plaintiff's Exhibit 18.)

Mr. Owen: This is a drawing of Fig. 3 of the patent in suit with claims 2, 5, 11 and 12 applied.

The Witness: Briefly, those different parts which are represented by numerals and by letters are: A torch body, No. 1, a wick W, a wick tubing 6a, 12a, a supporting and heat receiving flange 5a, a cap 7 with an imperforate top 8, with flame openings 9 and air inlets 10. The heat receiving and wick supporting flange is attached to the wick tube 6a, 12a, and rests upon the receptacle for the cap,

and in this manner supports the wick tube, and the 73
cap is screwed down into that same receptacle onto the flange, and by this means is a heat receiving flange.

After we had placed this patented torch on the market, that is, like Plaintiff's Exhibit 17, there were a great many sold. The sales increased up to the time of the depression.

The Court: Have you got the figures?

The Witness: I have, Your Honor.

The Court: Do you want the figures on the record?

Mr. Owen: Yes, I would like to have that 74
on the record.

The Witness: In the first year, 1929, there were 46,624 torches with Economy burners on the torches sold, and 18,359 burners sold separately, to be placed upon torches that were then in use, that is, the old open flame torches that were then in use. In 1930 there were 53,422 torches sold, 5,524 separate burners. In 1931, there were 52,953 torches sold, and 4,048 separate burners. These were of our manufacture.

At that time the depression was affecting our business quite severely; our regular business in 75
other fields had practically stopped, and we continued to maintain practically the same sales of this particular item. I received letters from customers indicating whether or not this new torch withstood high winds and rains. Those letters I read from in the Toledo record.

Mr. Owen: Well, if Your Honor will permit, we will just refer you to those letters if you are interested in reading the excerpts.

Mr. Wisner: Of course, I press my objection to the hearsay nature of the statements.

76 The Court: I do not understand that there will be any question about it. You both agree that it is efficient. The defendants say that the product they are making is similar, but they are both efficient. I do not think you have to waste much time about that. I do not suppose either of you would be producing them unless you thought that they were efficient.

The Witness: The old open flame torches such as Plaintiff's Exhibits 10 and 13 were not used as warning signals on the public highways for parked trucks and buses.

77 The Court: You left off what year, was it 1930?

The Witness: 1931, I believe.

The Court: Have you the succeeding years?

The Witness: I have the succeeding years. In 1932, there were 43,197 torches, 3,375 burners. In 1933, there were 76,919 torches, 1,904 burners. In 1934, there were 56,401 torches, 2,151 burners.

I did not list the Economy burners any further. The torches, in 1935, 134,831. In 1936, 186,479. In 1937, 129,739, making a total of all torches of 780,565, and Economy burners 35,361.

78 The prices during most of that time, the torch with the Economy burner, listed at $18 per dozen, I think, and now I think they are listed at $16, with 50 and 10 off. And the Economy burners were sold at $4 a dozen with the same discount; at that time I think the discount was 25 per cent, 25 and 5.

The date when the new torch, Exhibit 17, was placed on the market, as I remember, January 7, 1929, was our first invoice. Within a few months after we brought out the Economy burner, the McCloskey Torch Company followed with a burner which was very similar to it.

Q63. And when did the first infringing torches 79
or flares appear on the market?

Mr. Wisner: I object.

The Court: Of course, that is a question I will have to determine.

The Witness: The first infringing torch to appear on the market was the McCloskey torch, the one I was just speaking of. Others appeared particularly in 1933 and 1934. There were a number of a type similar to the Bolser Corporation, and those made by the Kari Keen Manufacturing Company. Those were the two involved in the Toledo case. We had three licensees at that time, the 80
Anthes Force Oiler Company at Fort Madison, Iowa, the K. D. Lamp Company of Cincinnati, Ohio, and the Do-Ray Lamp Company of Chicago, Illinois.

Economy burner is the name that we gave to our new patented burner. We gave it that name because of the economy in fuel and wick consumption. When we put this burner out on the market we marked it "Patent pending" until the patent was issued, and then marked it with the patent number.

Mr. Owen: Your Honor, we have intro- 81
duced quite a number of drawings showing the experimental devices, and the witness did not go into any detailed explanation. I would like to ask him to do that unless Your Honor would prefer not to have it.

The Court: Is it in that other record?

Mr. Owen: To some extent, yes.

The Court: Is that in question at all?

Mr. Wisner: Whether they made the experiments, I know nothing about it, I assume they did.

82 The Court: Unless it is questioned let us assume that they did.

The Witness: From the experiments which we conducted in 1928 resulting in the production of the Economy burner, we found that some types of burners would work better in some weather conditions and others in different weather conditions. There are some types of burners that would function in the wind, and the same burner that functioned well in the wind might not function so well in calm, comparatively calm weather, on a calm day. Others that would function well in calm
83 weather would not function so well in windy weather. The accumulation of carbon was particularly prevalent on the calmer days and in particularly cold weather.

The introduction of the Economy burner practically drove our open flame torches off the market; for a short time, a year or eighteen months thereafter, there were some sales of the old open flame burner, but then they stopped completely. The open flame burner was not customarily used as a warning signal for parked trucks and buses. There might have been one or two used in an emer-
84 gency that I do not know about, but otherwise they were not. The Economy burner is used for that purpose entirely now. Of course, there are some other burners of that type. I will say our Economy burner and other burners of that type are used exclusively. The only difference in a truck flare and the one used as a construction torch is in the size and shape of the torch body. The torch flare also has what we call a sealing cap on it which the contractor's torch does not. You can extinguish the flame, you can blow on it and blow it out.

Mr. Owen: One of plaintiff's truck flares is offered in evidence as Plaintiff's Exhibit 19. 85

(Marked Plaintiff's Exhibit 19 in evidence.)

The Witness: The torch is what has customarily come to be known as the contractors' torch, which is the larger size, usually spherical in shape, and sometimes, but not always, having a weighted bottom. A flare is the smaller torch which is used for guarding trucks and buses. The burners in our flares and torches are practically the same, except that in some of the flares we have what we call a sealing cap, and there is a slight difference in the part in which the cap screws. 86

Three other manufacturers besides those I previously mentioned have taken licenses under the patent in suit. I have some circulars here showing the constructions manufactured by our different licensees under the patent in suit.

Mr. Owen: The witness produces circulars as follows, which I will ask the clerk to mark as exhibits:

Dietz circular, as Exhibit 20.

(Marked Plaintiff's Exhibit 20 in evidence.)

Mr. Owen: Do-Ray Superflare circular, as Exhibit 21. 87

(Marked Plaintiff's Exhibit 21 in evidence.)

Mr. Owen: That is manufactured by the Do-Ray Lamp Company, Chicago, Illinois, and the Dietz is manufactured by the R. E. Dietz Company, New York.

Another circular of the Storm King Signal Flare, manufactured by Shanklin Manufacturing Company of Springfield, Illinois, as Exhibit 22.

(Marked Plaintiff's Exhibit 22 in evidence.)

Mr. Owen: One of Luck-E-Lite Truck

88 Flare, manufactured by Embury Manufacturing Company of Warsaw, New York.

(Marked Plaintiff's Exhibit 23 in evidence.)

The Witness: I conducted tests for the purpose of determining the fuel consumption of the old open flame Toledo torch and the patented torch. A series of tests were run on April 12, 15, 16, 17, 18, and 19, 1935. The burners tested were the old open flame torch, like Exhibit 10, and a torch using an Economy burner, like Exhibit 19. The summary of results was that the open flame torch averaged 4.95 ounces per hour and the flare 2.06 ounces per
89 hour of fuel. Each of those tests was conducted over approximately eight hours. There were six different tests of eight hours each.

Mr. Owen: I will offer that data sheet in evidence as Plaintiff's Exhibit 24.

(Marked Plaintiff's Exhibit 24 in evidence.)

The Court: Were they on the same size wick?

The Witness: Yes, those were the same size wick, Your Honor.

The Court: And under the same conditions?

The Witness: Yes, Your Honor, except that
90 in the old style torch the wick was extended one and a half inches as prescribed in the directions for its use, and in the Economy burner the wick was extended an eighth of an inch.

The Court: I mean was it done at the same time?

The Witness: Done at the same time, at the same place and under the same conditions.

Mr. Owen: I offer in evidence a sheet containing a drawing of the defendant's flare, with claims 2, 5, 11 and 12 of the patent applied.

(The sheet was received in evidence and 91
marked Plaintiff's Exhibit 25.)

Mr. Wisner: Are you seeking to use the witness as an expert, Mr. Owen?

Mr. Owen: No.

The Witness: This drawing shows a torch body "1," a wick "W" and a wick tube "6-A" and "12-A." A wick tube supporting flange "5-A" and a guard consisting of a cap, "7," with an imperforate top "8," with flame openings "9" and a heat receiving and conducting flange "11-A," and the air openings "10" in the heat conducting flange. I have tested torches constructed like this 92
drawing made by the Anthes Force Oiler Company alongside of our own flare, with the Economy burner. They operated substantially the same way. The results are substantially the same. I did not list the results myself. I observed those results, however. This is an Anthes flare like the one that I saw tested.

Mr. Owen: I offer it in evidence as a plaintiff's exhibit.

(The same was received in evidence and marked Plaintiff's Exhibit 26.)

The Witness: In conducting tests of the Econ- 93
omy flare and the Anthes flare, I know that note of the fuel consumption was taken but I was not following the figures on that.

I have an advertisement or circular of the McCloskey open flame torch, and one of the McCloskey closed flame torch. This closed flame torch was brought out within a few months after our Economy burner had been on the market. The first McCloskey open flame torch I saw was in August of 1925. I understand they had been in production since May of that year, but the first ones I saw was

94 in August. The figures of the McCloskey open flame torch show the proper wick extension, as it was practically used:

Mr. Owen: The circular of the open flame torch is offered in evidence as a plaintiff's exhibit.

(The circular was received in evidence and marked Plaintiff's Exhibit 27.)

Mr. Owen: I also offer in evidence the circular of the McCloskey closed flame torch.

(The circular was received in evidence and marked Plaintiff's Exhibit 28.)

95

Cross Examination by Mr. Wisner:

The Witness: My first personal connection with the torch field was in 1926.

The Court: What do you mean by that?

The Witness: I had some money invested in the Toledo Pressed Steel Company since August of 1925. I did not personally participate in the company until 1926.

The torch which has been marked Plaintiff's Exhibit 10 came out in November of 1926. I think the
96 cubical contents of that torch is 7/10ths of a gallon. I do not know what the cubical contents in inches is. I cannot tell you what the inside height is from the bottom to the top space. This structure, Plaintiff's Exhibit 10, was superseded by Exhibit 13. Exhibit 10 was the one I tested in contrast with the improved torch, Exhibit 19. Exhibit 13 was superior in some of its performances, to Exhibit 10. The wick size is three-quarters of an inch.

The Court: Did you test Exhibit 13?

The Witness: No.

The Witness: We used the earlier torch for

comparative purposes, Your Honor. We recommended a wick extension of one and a half inches. We based our recommendation of one inch and a half wick extension on tests that we made, and extending the wick to get the best results in severe weather, and also the fact that when you put the torch in use in the evening, that before morning a considerable portion of that wick was burned off, and during the night there is a possibility of sudden storms, and it was necessary to at least start with an inch and a half in order to have sufficient wick to function during the night. The same kind of wick is in the new improved torch, Exhibit 19, that was in Exhibit 10. 97 98

The Court: Now, what do you mean, the same what? A. The same dimension.

The Court: You do not mean the extension?

Mr. Wisner: No, Your Honor. It is extended up much less.

The Witness: Our theory was, in making the change from the torch with the wick tube which protrudes from the top to the torch from which no wick tube protrudes from the top, that a breeze blowing would cool the wick tube and thereby cool the oil, and also that the wick tube extended down into the body and it could, therefore, conduct heat into the torch body and help heat the oil in the body itself. That is if the oil inside the container is hotter, the flare is more likely to stay lit. Our experience is that we can keep it hotter by inverting the wick tube and having the extension down in rather than up above where the wind can play on it. We made various experiments in all of which we maintained the wick tube down inside. We had already made our experiments with the wick tube up, and concluded that was not right. 99

100 XQ130. So when you began putting the hood around the torch, one of the purposes of that hood is to prevent any cool air from reaching the wick tube? A. No.

The Witness: The effect the hood has on the wick tube is that it reflects heat back on the tip of the wick, where the foundation of the flame is, and also is heated and there is a conduction of heat through the cap down through the flange into the wick tube surrounding the wick at the tip. One of our objects in putting this structure on was to keep that wick tube hot.

101 XQ133. And keep the breezes from blowing on it? A. No, we had never thought about the breezes.

XQ134. You abandoned the attempt to prevent the breezes from blowing on it when you turned the wick tubing upside down— A. We did not abandon, we had accomplished it then.

XQ135. That was the way you did it? A. That was the way we did it.

XQ136. Now, the patent says something about a dead air space. That, I assume, is the space which exists immediately below the air ports and between
102 the side of the flame, guarding the wick tube? A. That is around the wick.

XQ137. Around the wick, between the end of the wick and— A. I don't think the patent says dead air space.

XQ138. A layer of quiescent air? A. A layer of quiescent air.

XQ139. And the positioning of these air holes is such that that layer of quiescent air is permitted to exist? A. It really is not quiescent air, it does not go anywhere, it circulates around down in there, it is not really quiescent but it is prevented from moving out of the cap.

XQ140. Now, as I understand you, this particular structure is a compromise—that is, you tried out various structures, some would work well in calm weather and some would work well in very stormy weather. Now, in which particular kind of weather is this structure supposed to work? A. In both. 103

XQ141. And does it work better in calm weather or better in stormy weather? A. It works a little better with the wind blowing.

XQ142. Not so well in calm weather? A. No. If we were to light this torch and set it out—whether there is any wind or not—some soot would immediately begin to accumulate around the top burner, both on the inside and outside, and some around the flame port. There would be an accumulation of those particles of soot—that is true of all burners. Soot would accumulate around the wick tube of such a burner as Exhibit 10. The burner marked Exhibit 17 is the type of construction torch that we put out first, using this burner, except for what we call a screw collar. There is no important difference, however. In these tests that we made, comparing the performances of the two burners, we made no test between the large torch Exhibit 17, and the large unprotected torch, Exhibit 10. In connection with this torch, Exhibit 17, we put out some circulars. 104 105

XQ149. And in any one of those circulars which were offered in evidence in the previous case, was there a statement to the effect that the torch would burn in windy or rainy weather for 24 hours or more—I refer to the torch of the type of Exhibit 10? A. That is probably true, I don't know.

XQ150. Some such statement to the effect, "This large torch will burn through wind and rain for

106 twenty-four hours, if necessary, on one filling," was made in that circular, was it not? A. I presume so.

Those tests which I summarized in Exhibit 24 were made on the roof of our factory building at Toledo in the day time. In those tests the wick of the torch under test, the open flame torch, was an inch and a half high and the wick of the enclosed flame torch was one-eighth inch high. I did not make any observations of the amount of light which the respective torches emitted, the candle power, the light that was given off was suitable for the
107 purpose for which they were intended. There was a wind blowing.

The Court: I suppose—of course I do not know if it can be agreed, but it seems to me with the open wick there would be more light than with the closed, ordinarily I suppose that would be so.

Mr. Wisner: Ordinarily. In some cases there is and in some cases there is not.

The Court: I am not talking where it is blowing too hard, but I am talking about where you light it under ordinary conditions.

108 Mr. Owen: I would like to have the witness answer that inquiry.

The Court: All right, answer it.

The Witness: We weren't interested in the amount of light given off, because the light in either case was sufficient for the purpose for which the torch was intended.

I do not know how fast the air was blowing at any time during the tests. I had not means of measuring it. When I tested comparatively the defendant's flare and the plaintiff's flare, there were no such measurements made on those tests. They

looked to function in the same way, and they with- 109
stood the same kind of wind, and in comparison with our open flame torch the open flame torch would go out and both the Toledo torch and the Anthes torch would remain lighted.

The Court: When you say they went out, was there a wind?

The Witness: Yes, there was wind.

I did not at any time ascertain what the fuel levels were in the torches which I was testing. I did not participate in that; my tests were purely of observation. When I tested Exhibit 10 and Exhibit 19 we filled them up to the top, then weighed 110
them and burned them, and then reweighed them to find out how much oil had been consumed. Referring to Exhibit 18, and the numeral 7 on the left hand of Fig. 3 of that exhibit heat was conducted down the side of this cap, down the left side, for example, and down into the ring unnumbered at the bottom of the cap it went around the side of the hole. The heat that would go into the flange 11a would only be through the contact that this particular wick tube has with 5a. There is some heat conduction in 11a other than what it receives from 5a, but that would be from heat reflection 111
from the flame onto 11a itself. The path of the heat reflection I am talking about is a general heat enclosed within a very small space that is radiated and reflected back from the walls of that small space. And it is reflected from the dome 8 down to this flange 11a. There is some conduction from the flange 11a to the wick tube. Flange 11a is supported itself by the flange 5a. I referred to it only in conjunction with 5a as supporting and heat receiving flange. The real point of support for the flange is on 5a alone. They are supporting the wick tube and the wick.

112 Prior to my investment of money in the Toledo Pressed Steel Company in 1925, I had had no experience in the manufacture of torches.

Redirect Examination by Mr. Owen:

The Witness: The reason we did not test the open flame torch, Exhibit 10, against the closed flame torch, Exhibit 17, for fuel consumption was that the tests were being made to compare the Toledo torches against the infringers in the Toledo case, and the exhibits that were being used or were going
113 to be used were all flares, so we were testing the Toledo flare against the flare of Kari Keen and Bolser, and that is why the flare of the Toledo Company was used rather than the torch. We were testing all three against the old open flame torch for fuel consumption. There was no difference in the construction of the burner in the Economy flare that was used in that test, Exhibit 19, or one like Exhibit 19, and the burner which formed a part of the Economy torch, Exhibit 17. The wick extension in the open flame torch like Exhibit 10, which was tested with the Toledo flare, like Exhibit 19,
114 and the Bolser and Kari Keen flares, had a wick extension the same as that flare or torch was used in practice in the field. In other words, the adjustment of the wick there was exactly the same as we recommended for use in the field. And the adjustment of the wick in the new Exhibit 19 flare was the same as we recommend for use in the field.

The Court: By the way, how high was that wick?

Mr. Owen: They recommend an eighth of an inch in their literature.

The Witness: In the old open flame Toledo torch

the wick consumption would depend on how often 115
it was used. The consumption for over night would vary from one inch to—from three-quarters of an inch to an inch or an inch and a quarter. Those wicks were eighteen inches long. I think those wicks would probably function down to within six or seven inches. There had to be enough wick left to extend to the bottom of the torch. That would be approximately seven or eight inches, so that about ten inches could be burned.

Recross Examination by Mr. Wisner:

116

The Witness: In the defendant's structure the heat would be reflected from all the inside surfaces of the cap 7, and there would be some reflection as well as conduction of the flange 11a onto the wick tube. The flange 11a in the defendant's structure does not support anything; it is supported by the wick tube.

RXQ. Still referring to the drawing, Exhibit 25, and defendant's structure, the wick tube there is so positioned that these cool airs which were so deleterious to the proper burning of the flare can play upon it, can they not? A. Yes, that is true. 117
You are talking about the old open flame construction?

RXQ. Yes, the air that played onto the protruded wick tube of Exhibit 10, likewise plays upon the wick tube of the defendant's torch, as shown in Exhibit 25? A. That is right.

Redirect Examination by Mr. Owen:

RDQ. Do I understand you to say that the flange 11a does not support anything in defendant's struc-

118 ture? A. It is supported by the wick tube; it does support the cap 7.

RDQ. I do not recall whether I asked you regarding the wick consumption in your Economy torches and flares. A. There is practically none. In fact, we guarantee the wicks for a year, and we never have had to make good on that guarantee.

LYMAN W. CLOSE, called as a witness on behalf of the plaintiff, having been duly sworn, testified as follows:

119 *Direct Examination by Mr. Owen:*

The Witness: I am a resident of Toledo, Ohio, and vice-president of the Toledo Pressed Steel Company.

The Court: Is this witness your expert, Mr. Owen?

Mr. Owen: No, Your Honor.

The Witness: I am one of the inventors of the patent in suit. Prior to the invention of the patent in suit, after studying mechanical engineering at the Armour Institute of Technology, I joined
120 the engineering department of the Griffin Wheel Company in Chicago, and I had considerable experience in plant lay-out work at Denver.

The series of drawings that Mr. Withrow produced marked Plaintiff's Exhibit 15, have typewritten matter on them. I placed it there. It represents an explanation of the construction and function of the device so pictured. I made those sketches myself.

I am familiar with the tests to which torches and flares are subjected by the different states, in deciding whether they will be accepted for use on the

public highway. I have attended such tests in the 121
State of Iowa, the State of Ohio, and the Electrical
Testing Laboratories here in New York. The tests
in Iowa consisted of a wind tunnel test to determine whether or not the torches would withstand a specific wind velocity of 35 miles an hour, I believe, I would have to check that,—35 or 40 miles an hour, which they require in order to approve torches for use in the State of Iowa.

Tests made in Ohio were of a similar nature. They used a wind tunnel to determine the velocity at which the torch would burn consistently. They set a maximum of 35 miles an hour. We tested the 122
torches in that wind tunnel test and demonstrated that they would pass that 35 miles an hour test. In Ohio we tested the open flame Toledo torch, we tested the closed flame Toledo torch and the Toledo flare. The ones with the closed burners passed the tests successfully and those without did not. The Electrical Testing Laboratories here in New York conducted tests on flares of all manufacturers, in order to establish whether or not they would be satisfactory for use in the State of Pennsylvania. The State of Pennsylvania got up a set of specifications, and those specifications were followed in the 123
tests by the Electrical Testing Laboratories, not only on our flares, but on practically all other manufacturers' flares. Plaintiff's Exhibit 6 is a facsimile of the report of the results offered by the Electrical Testing Laboratories on a test made on the Anthes type 8-B flare.

Q19. What were those tests?

The Court: Are they set forth there?

The Witness: They are, Your Honor.

Q20. Referring to the tests set forth in that document, will you state how those tests were con-

124 ducted in your presence, with the Toledo Economy flare? A. There were four main tests, one of them was to subject a set of flares to a vibration test through a quarter-inch amplitude of 300 vibrations per minute, with an anvil shock test on each vibration. This test continued for two hours. I witnessed the test and saw the results of our torch which passed the necessary requirements. There was a weatherproof test in which the flares were lighted and subjected to a standard spray of water at 1/10th of an inch a minute for 15 minutes, and then 3/100ths of an inch a minute for 30 minutes
125 and 1/100th of an inch a minute for 45 minutes, during which time the torch was rotated at the rate of 4 revolutions a minute. We passed that test.

The water was applied through a standard spray inclined at an angle of 60 degrees, right on the top of the torch and the surrounding area.

The third test was the visibility test, the requirements being that the torch be visible for 500 feet. The qualifications were interpreted in terms of candle power and the candle power of the torch was measured while being subjected to an air stream of 5 miles an hour and rotated four times a minute,
126 at the rate of 4 revolutions a minute, and the amount of candle power demonstrated was at a visibility of 500 feet. The same requirements that they be visible at 500 feet was invoked for a velocity of 40 miles an hour. Of course, there was more light issued by all torches at 5 miles an hour than there was at 40 miles an hour, but the candle power at 40 miles an hour was still sufficient to enable the laboratory to report that it was visible at 500 feet. That 40-mile an hour test was continued long enough to measure the candle power.

The next test was the reliability and light test.

A 40 mile an hour wind was played on the torch, and it was required to stand that wind while being rotated at the rate of 4 revolutions a minute, for 15 minutes, and thereafter a 5 mile an hour wind was directed against the torch and it was rotated at the rate of 4 revolutions a minute and required to burn 11 hours and 45 minutes, or a total of 12 hours in total time. That was the end of the test and our torch passed that test also. Our burner passed all the tests. The flare which was tested was like that of Exhibit 19. 127

New Hampshire, Rhode Island, Nebraska, Louisiana, Arkansas and several other states have requirements similar to that of Pennsylvania. Approximately two-thirds of the states now have flare laws, and approximately one-half have laws similar to those of Pennsylvania. 128

The Court: What are those tests for—that is, where are the flares used?

The Witness: The torches are used for buses and trucks, Your Honor, on the highways.

A typical flare law regulating traffic on highways in the State of Arkansas reads:

"No person shall operate any motor truck on a highway outside of a business or residence district at any time from a half hour after sunset to a half hour before sunrise, unless there shall be carried in such vehicle a sufficient number of flares, not less than three, or electric lanterns or other signals capable of continuously producing three warning lights, each visible from a distance of at least 500 feet, for a period of at least 8 hours, except that a motor vehicle transporting inflammables may carry red reflectors in place of the other signals above mentioned. 129

130 "Every such flare, lantern, signal, or reflector, shall be of a type approved by the Commission, and it shall publish lists of those devices which it has approved as adequate for the purposes of this section."

The approved specifications are not set up here but our flares, like Plaintiff's Exhibit 19, pass these various requirements.

There is an Interstate Commerce set of specifications which affects vehicles engaged in interstate commerce, and handling materials which are interstate in their aspect. The law of the Interstate
131 Commerce Commission reads as follows:

"On every bus, truck, or truck tractor operating outside the corporate limits of municipalities—"

I might say that this is Section D of No. 3 of the Motor Carrier Safety Regulations, gotten out by the Interstate Commerce Commission, Item B under No. 8, and it reads:

"At least three flares or three red electric lanterns, unless the motor vehicle is operated solely on streets or highways which are artificially lighted at night; each flare (liquid burning pot torch) or red electric lantern shall be capable of being seen and
132 distinguished at a distance of 500 feet under normal atmospheric conditions; each flare (pot torch) shall be capable of burning for not less than 12 hours in 5 miles per hour wind velocity, capable of burning in any air velocities from zero to 40 miles per hour, substantially constructed so as to withstand reasonable shocks without leaking, and shall be carried in a metal rack or box."

And then there is a footnote which reads:

"Flares (pot torches), fusees or any signal produced by a flame, shall not be carried or used as warning signals for motor vehicles used in the

transportation of inflammable liquids in bulk and 133
for motor vehicles transporting compressed inflammable gases; but in lieu of such flares and fusees three red electric lanterns shall be carried and used as warning signals for such vehicles."

Mr. Owen: I understand that the Anthes defendant's torch has passed all of these requirements. That will not be disputed?

Mr. Wisner: As far as I know.

The Witness: We first marketed our Economy torch in January of 1929. I heard Mr. Withrow's testimony regarding certain fuel consumption tests conducted about 1935. I was present at those tests 134
and can verify them. I have conducted tests of the Toledo and Anthes closed type flares, for the purposes of showing the comparative fuel consumption. The results show that the fuel consumption of the two torches was substantially the same, under the same conditions. Those tests were conducted since February the 1st, 1938, in Toledo on the roof of our factory building, under normal conditions. We also conducted wind velocity tests and fuel consumption tests and luminosity tests. The wind velocity tests were conducted in the wind tunnel at Polytechnic Institute in Brooklyn, in the 135
wind tunnel of the mechanical engineering laboratory.

Oh, I think that you refer to the wind tunnel test made in Toledo? We have a wind tunnel in Toledo, built to the specifications suggested by a fan manufacturing company, and we were enabled by the use of reduction plates on the back of this tunnel, having a fan of fixed velocity, to vary the speed within certain restricted limits. The torches were tested in front of this wind tunnel at those various speeds, under the same conditions.

136 We found that the highest speed that we could get in that tunnel with that fan velocity was 28 7/10ths miles an hour. Inasmuch as 15 minutes was the limit on the state tests, we arbitrarily determined that if the torch gave evidence of burning continuously for more than 15 minutes, that we would stop the test at 15 minutes. The Anthes and Toledo torches both withstood that air speed and also the lower speeds, of course.

We also tested the old style Toledo torch under the same conditions. At the lower speed of 25 1/10th miles an hour the Toledo old style torch
137 stayed lit for 15 minutes, so in fairness we stopped that test at that same time.

At 26 9/10ths miles an hour speed, it put the Toledo old style torch out in 15 seconds, whereas at a higher speed of 28 miles an hour the old style torch stayed lit for 2 minutes and 30 seconds. This brings out the characteristic of that type of torch, which is its uncertainty. At one time it will perform under one set of conditions, and another time, under the same conditions, it will act differently.

The Court: You are testifying as to what you observed?

138 The Witness: Yes.

In the wind velocity tests on the Toledo and Anthes burners the wicks were extended one-eighth inch. The wick in the Toledo old style burner was extended one and a half inches. We also tested that Detroit three-wick torch, and extended those wicks a quarter of an inch.

I haven't given you the results of the test on the Detroit: At 25.1 miles per hour the Detroit stayed lighted for five minutes. At 26.9 miles per hour it stayed lighted for two minutes. At 28.7 miles per hour it stayed lighted for fifty seconds.

I tested the Toledo open flame torch at the same 139
time. It stayed lighted fifteen minutes at 25.1 miles per hour; for five seconds at 26.9 miles per hour, and thirty seconds at 28.7 miles per hour.

We made fuel consumption tests running seven days—the devices are those shown in Plaintiff's Exhibit 8. Those are the four torches tested in this test. The test was started on February 1st, continued on the 2nd, 4th, 5th, 7th, 8th and 9th of February, 1938, at Toledo. There were various time periods of four, seven, eight and a half, seven, seven, nine, 6.75, and 6.77 hours that were covered by those tests, and the averages were taken of the 140
total fuel consumed by each of those four torches. That was reduced to the rate of ounces per hour, and an average of those seven tests is as follows:

The Toledo Economy burner burned at the rate of 1.637 ounces per hour.

The Anthos burner burned at the rate of 1.633 ounces per hour.

The Toledo old style open flame torch burned at the rate of 4.634 ounces per hour.

The Detroit Street Railway torch burned at the rate of 4.238 ounces per hour.

The Court: In the case of the old style 141
torch, the wick was how far out?

The Witness: The old open flame torch, in that case the wick was extended a length of one and a half inches, and on the Detroit, one-quarter of an inch.

The Court: Is that usually the correct amount?

The Witness: That is the correct amount.

The Court: Not less.

Mr. Wisner: May I point out to Your Honor that the Detroit Street Railway man

142 testified that they used one-half inch extension.

The Court: He was just saying what his experience was.

The Witness: An inch and a half is right on our torch on an average weather condition. You are apt to meet extreme conditions that you do not know ahead of time. In those tests we had a wick extension of a quarter of an inch, on each of the three wicks of the Detroit torch. That is torch A on this Exhibit 8.

Q59. How did you arrive at that wick extension?

143 The Court: It all comes down to this: Counsel for the defendant concedes, and properly so, it seems to me, that the longer the wick the more oil will be consumed. Now, the difference between you is whether or not the wick should be extended an inch and a half or less.

Mr. Owen: Yes. I will ask the witness what his experience has been.

The Court: Because it is common sense to realize that the longer the wicks are the more oil will be consumed.

The Witness: My experience in determining the
144 length of wick exposure which is desirable for all kinds of uses of this open flame construction torch such as shown at B in Exhibit 8 was as follows: when we started out with that torch we wanted to have the wick extended as little as possible; common sense dictated that. Complaints began to come in because torches were going out. Naturally we wanted to strengthen the flame, and we decided that a longer wick exposure would assist in solving that difficulty. And after considerable experience in settling complaints, making tests of our own, we found that an inch and a half was about the shortest

length you could bank on over night, because we did not know ahead of time what kind of conditions were going to be met. As we extended the wick the fuel consumption rose, I would not say it was directly proportional to the exposure of the wick, because I cannot say that definitely. 145

Mr. Withrow's attention was called to some statement that plaintiff had made in connection with those open flame burners, that one of them had burned for twenty-four hours, that might have been one with a short wick extension or a tighter wick. There are so many variables that enter into the consumption and operation and performance of a test, it might have been a tighter wick that didn't feed oil as freely. It would be entirely possible for one of these open flame Toledo torches to burn for twenty-four hours under proper weather conditions and with the proper wick extension. 146

I have a memorandum of the fuel consumption tests of the Toledo and Anthes flares, to which I have just testified.

Mr. Owen: I offer them in evidence as Plaintiff's Exhibit 29.

(Marked Plaintiff's Exhibit 29 in evidence.)

The Witness: By experiment we found that one-quarter of an inch extension on each of the three wicks in the Detroit torch would give approximately the same volume of flame given off by the one and a half inch wick extension on the Toledo old style torch. On the Toledo flare and Anthes flare used in those tests we had a wick extension of one-eighth of an inch. I have here a written report on the wind velocity tests of the same four devices shown in Plaintiff's Exhibit 8. We didn't measure that ourselves, but I witnessed it measured by a Taylor anemometer produced by the De- 147

148 Vilbiss Company, whose specifications were followed in building the tunnel.

Mr. Owen: The wind velocity test data produced by the witness is offered in evidence as Plaintiff's Exhibit 30.

(Marked Plaintiff's Exhibit 30 in evidence.)

The Witness: I have here a photograph of the wind apparatus which we used in those tests.

Mr. Owen: This photograph produced by the witness is offered in evidence as Plaintiff's Exhibit 31.

(Marked Plaintiff's Exhibit 31 in evidence.)

149 The Witness: This photograph shows the wind tunnel in our plant at Toledo which I have already described.

Cross Examination by Mr. Wisner:

The Witness: I do not have a copy of Plaintiff's Exhibit 31, the photograph of this wind tunnel, but I am familiar with it. The photograph purports to show a flare on a platform at the end of the wind tunnel.

Now, in these state tests about which I testified,

150 the practice is to center the flame of the flare upon the center of the wind tunnel. That was not done in this case. I mentioned that I made some measurements of the volume of the flame produced by the Detroit Street Railway torch, and the unprotected Toledo torch, with an inch and a half wick extension. This measurement was purely visual. We compared them visually as to size. We did not use a photoelectric cell to take it accurately. I do not know what the candle power was that was produced by the one in comparison with the candle power produced by the other. We assumed they

were the same size as you would view them, that is all. When we were determining to our own satisfaction that an inch and a half wick was the most satisfactory extension, the test was simply that we pulled it out—we started with a lower extension, and as they were extinguished under average weather conditions, we raised them up until we found that an inch and a half tested the best under average conditions on several occasions, and concluded to recommend that length. An average weather condition is a condition that you would meet with from a repetition of tests over a number of nights, from a calm night to a windy night, or a rainy night, so that you get all different conditions included. And it wasn't measured in miles per hour, and I would not know how to evaluate it in miles per hour. We took wind and rain into account. I could not say how much rain in inches per hour because we did not take any figures on that.

I wouldn't say the torch would work better under certain conditions if the wick were not out an inch and a half; it probably would consume less fuel. Of course, if it was not extended very far it would produce less light than if it was extended extremely far. The difference between an inch and a half and one inch, for instance, might be very slight to the normal eye, but possibly it would show considerable difference in candle power. When this is extended an inch and a half you have a great big bonfire when you start, but it settles itself down normally to a point where it isn't terribly big. That is what burns up the wick. Of course, the wind burns the wick, fanning the flame off onto one side, and bringing the glowing embers of the wick into a charred condition is what consumes the wick. As

154 long as there is oil on the wick and the oil is being volatilized, the wick is not being consumed. It is only the vapor of the oil that is being consumed then. But when the vapors are blown to the opposite side of the wick, leaving the extremely hot ends of the wick in the fire, at the firing point of the wick, you might say, they are charred and are consumed by their own combustion.

A great many states do not have any tests at all, for example, the State of New York has no tests or requirements for flares. They have a flare law, but no specifications for approval.

155 XQ96. The only states maintaining state laboratories are Iowa, Nebraska and Minnesota, are they not? A. Well, they use the university, the Ohio State University, in Ohio, because I have witnessed tests down there, passed those tests. And the tests are conducted by the Highway Department in the mechanical engineering laboratory of Ohio State University.

These states that have a law similar to the one, for instance, in Pennsylvania, are more difficult to qualify a torch than in other states because of the rigid requirements in the specifications, as noted
156 in my testimony. Nebraska is one of those states, because it has practically the same law, the same specifications.

I did not testify that I made observations of visibility at 500 feet on the roof of our building at Toledo. I testified to no visibility observation. I did not testify that we made any attempt to test visibility.

The fuel consumption test was made up on the top of our building. It was on top of a building that has a factory under it, one-story factory. I imagine the roof is about, at this particular point,

50 feet above the ground. The torch was placed on 157
a platform which was elevated above the roof about 6 feet, so that the torches were away from any protecting wall surfaces or anything of a similar nature. They were burned during the day time when we could observe whether they would stay lit. We would light them in the early morning and extinguish them at night.

The torch is intended to be used on the road. That is, at an elevation of perhaps six or seven inches from the ground with the bottom of the torch resting on the surface of the pavement.

With reference to the wind velocity test disclosed 158
in Exhibit 30, that motor which we used was not a variable speed motor. That is, we put a plate with an orifice of varying size over the end of the wind tunnel. We measured the wind velocity by a Taylor anemometer in the position of the torch.

XQ121. That is, you took the velocity reading at one time, and then subjected the torch to what you considered to be that velocity, and then took that other reading, is that it? A. That is true.

XQ122. So there was no continuous reading of velocity while the torch was being burned? A. No; the motor had a constant speed. I was present 159
continuously during these wind velocity tests.

With reference to this letter marked Plaintiff's Exhibit 27 in the preceding case, tried in Toledo, Ohio, I was present at some of the tests described in that letter. On page 2, the third paragraph, he states: "For the wind test a tunnel was prepared"— He is not there discussing any test in particular, he was discussing the method of making these tests. I saw him follow this method before the date of the letter. That was probably a little less than two years before that date.

160 Mr. Wisner: One of the last things we had before us yesterday on adjournment was the question of this Exhibit 27 in the Bolser case, which was a letter written by one of the testing engineers for the State of Iowa which the plaintiff was seeking to have put in evidence.

The Court: I will permit anything as to the tests, but so far as conclusions are concerned, I will not be bound by any conclusions of anybody else.

Mr. Owen: May I offer the letter with that understanding?

161 The Court: Yes.

Mr. Owen: Letter from the State of Iowa Commission, State of Iowa, to the plaintiff, is offered—

The Court: This is offered in lieu of testimony.

Mr. Owen: It was marked as Exhibit 27 in the Toledo case. Possibly I had better offer a copy of it without any markings on it.

(Marked Plaintiff's Exhibit 32 in evidence.)

The Witness: I identified certain photostatic drawings marked here in Exhibit 15 as having been

162 made by me. They were made long after the devices which they seek to explain or disclose were constructed. They were made from memory. And the devices which they portray are no longer in existence, as far as I know. There may have been some slight differences or variations between the actual devices and these dr[illegible]

I think you will find on that tag that was offered as one of our exhibits there is an instruction not to spread the wick. In connection with these tests which I have testified about, in so far as I know the wicks were used as instructed on our tag. That

is, when we tested them we did not have them splayed, but it was all in one tightly bound compact unit, the wick was just cut off as it was made and used in that manner. 163

Redirect Examination by Mr. Owen:

The Witness: I was asked on cross examination whether the sketches, Plaintiff's Exhibit 15, accurately represent the devices which we made and tested. They do not differ in any substantial regard from the devices which were actually made and tested. They truly represent the construction of those devices. 164

Recross Examination by Mr. Wisner:

RXQ140. You testified on your direct examination with reference to the statement made in one of the circulars covering the Toledo torch which I now identify as Defendant's Exhibit A in the preceding case, appearing on pages 217 and 218 of the record in that case, with reference to this statement as follows: "It will burn through wind and rain for more than 24 hours, if necessary, on one filling." That you state might have been with a short wick? A. Well, I do not think it is really necessary to qualify that statement, because we have had that performance repeatedly and variations that would occur in normal construction of a torch might affect it one way or another, but I believe that to be a true statement of the ability of the average torch. 165

Mr. Owen: I have handed up to Your Honor a copy of Judge Hahn's opinion, and inasmuch as that opinion discusses the ques-

166 tion of infringemennt, I wish to offer a drawing of the Bolser flare which was introduced by the defendant in the Toledo case. This I will ask be marked as a plaintiff's exhibit.

(The drawing was received in evidence and marked Plaintiff's Exhibit 33.)

Mr. Owen: I also offer in evidence a similar drawing of the Kari-Keen flare in the Toledo case.

(The drawing was received in evidence and marked Plaintiff's Exhibit 34.)

Mr. Owen: I now offer a stipulation en-
167 tered into by counsel for the respective parties with reference to the use of soft copies. One of the flares sold by the defendant in this case is shown by the blueprint attached to the stipulation.

(The stipulation and blueprint were received in evidence and marked as one exhibit, Plaintiff's Exhibit 35.)

Mr. Owen: I also offer in evidence as a plaintiff's exhibit stipulation relating to the incorporation of the plaintiff company and other allegations in the bill of complaint which
168 were denied or not admitted by the answer, and also having attached a copy of the license agreement between the plaintiff and the Anthes Force Oiler Company.

(The stipulation was received in evidence and marked Plaintiff's Exhibit 36.)

DEPOSITION OF PHILIP A. KERWIN TAKEN MARCH 3, 1938, AT TOLEDO, OHIO

PHILIP A. KERWIN, having been first duly sworn, testified as follows:

Direct Examination by Mr. Owen:

The Witness: My name is Philip A. Kerwin; I am 52 years of age; superintendent of Way and Structures Department of Street Railways, City of Detroit, Michigan. I was superintendent for the Department of Street Railways since the city bought the Detroit United Railways, May 15, 1922; previous to that I was assistant superintendent of the D. U. R. Lines. I was connected with the D. U. R. Lines in that capacity for about five years before 1922—about 1917. Previous to that I was chief clerk of the Way and Structures Division, from May 1, 1907.

When I first became connected with the Detroit United Railways, they were using red lanterns. They set them around the excavation in the street. They would be broken, stolen, and the losses were quite substantial from those causes, and they still are. We still supplement them—we use both—supplement the torches with the lanterns. We now use mostly a castiron torch, kerosene torch, with a three-wick cap, open flame. The castiron torch was first used about 1913, through 1913 and '14, and the record drawing showing the type of torch is dated March 1, 1915. I am referring to a blueprint from the old Detroit United Railway's records. I believe it has a number on it—Drawing No. 101-17.

172 I made this blueprint off the tracing which was turned over to the Department of Street Railways with the records of the Detroit United Railways. I was first familiar with that tracing, or with blueprints made from it in 1915. This device, marked Plaintiff's Exhibit 7, which is shown in this blueprint, was the idea of John Kerwin, who was the superintendent of Way and Structures at that time. He is my uncle. I did not bring the tracing with me. The device shown in Plaintiff's Exhibit 7 is a container about 8⅛ inches high, about 5¾ inches wide, fitted with a cap, a threaded cap, drilled to
173 take three wicks. That container shown in the left-hand figure is cast iron. The figure in the upper central part of the blueprint is a plan view of the circumference of the torch. The two figures on the right-hand of the print are sections—two sections, one a cross-section, and the other a plan view of the cap that is drilled to hold the wicks, which threads down into the casting. The three wick holders are shown in the upper right-hand view. They are drilled vertically in the cap, and each one holds a wick. In practice, the average wick extension used in that torch is approximately a half an
174 inch above the top of the cap. About a month ago I gave one of those torches to Mr. Close of the plaintiff company.

In Plaintiff's Exhibit 8 I recognize the device marked "A" as the one that I gave Mr. Close. It was one carried over from the old D. U. R. days, an old torch that I got out of the store room for him. It was in such condition that it could be used; it is pretty well scarred up; one of the ears knocked off of it, and it is simply a relic; that type is not used now any more. We started to use that type about 1913, and we used them for the first few years

under the city ownership—I would say up to about 175
1924 or '25.

While that type of torch was in use, we had trouble from its being extinguished by drenching rains, although a high wind would extinguish it also. We took precautions against having these torches blown out or rained out by experimenting while still in the D. U. R. ownership—that would be before 1922—with a small umbrella covering that was made in two ways, trying to find the way that would be best; one way was supporting it on three legs rising between the wick openings; another way was just a center pin raising up from the center 176
of the cap to carry the umbrella. We used them for probably a couple of years. Our difficulty was with the center pin, that in throwing the container around, it would be bent and sometimes broken, and with both the center pin and the one supported with three legs, we still had trouble with the torches being extinguished in a drenching rain or in a very high wind, and so we concluded that those happenings were so infrequent that we could just as well get along without the cap, and we discontinued the use.

The blueprint of that umbrella made by the De- 177
partment of Street Railways of the city of Detroit in 1926, March 24, 1926, shows the torch itself cut down to a 4¾-inch height, and it also shows the umbrella supported on the center pin. That, however, while shown on the drawing, we have not used in the Department of Street Railways ownership since 1922, although it is shown in this record drawing of 1926. We have never used any type of umbrella since experimental days of D. U. R. before 1922. The experimenting was done upon this type and the three-legged type, and although

178 this is shown on the city drawing, it was never used since the city used the lines. These blueprints marked Plaintiff's Exhibits 8 and 9 are the city drawings.

To the best of my recollection, we experimented with this umbrella over the three wicks for a period of a couple of years and then discarded it as giving just as much trouble and having just as many flames go out as if we hadn't carried it at all. It did not remedy the defect that we were trying to overcome. We have trouble today from these torches being blown out or rained out. For the
179 protection of the public under those conditions, all excavations are protected at night time, in addition to the mechanical protection of torches, by watchman. He has many duties, takes care of the tools, watches them that nobody steals them, and makes the rounds regularly to see that the torches are burning, and if they are extinguished by rain or high wind, it is his duty to relight the torches.

The theory on which three wicks were used instead of one was that if one wick were to become short and should go out, you would still have the protection of the other two; and if two went out,
180 you would still have one. If a rain or high wind puts out the flame, it is apt to put all of them out. The idea is, sometimes the workmen are careless, and they might have a short wick in there that might burn out, which would still leave a light if the other wicks were long. If in a wind or rain one or two of the flames were extinguished, they would be relighted if one remained lighted.

I know of the closed torch like that put out by the plaintiff in this case, The Toledo Pressed Steel Company. It is a good many years ago that I first saw that torch; that is, I don't know whether

it had the cap on it when it first came out. I 181
couldn't say exactly how long I have known of the cap; I would say it is probably eight or ten years. Those have never been used by the Detroit United Street Railways because we have a torch designed to take care of our peculiar circumstances. The torch has got to be low enough to set down in the depth of the brick pavement. We find that where we are working in between the rails of the track, the side—the street alongside, the driveways on the street alongside of the excavation are passable; people, however, will follow a street car down the track, and if the car is traveling along at fifteen, 182
twenty miles an hour, and they are following right behind it, they go into the excavation unless it is protected between the rails, and so for that reason we dig up the brick, a couple of rows of brick across the track, and set these torches down in the space from which the brick has been removed, which brings the flame just about level, or just above the level of the brick pavement, in which case the cars pass over without knocking over the torches. That is the torch which is shown on the blueprint last produced, Exhibit 9.

183

Cross Examination by Mr. Wisner:

The Witness: In 1913 I was chief clerk of the Way and Structures Division with the Detroit United Railways. I had charge of the records, of directions issued through the superintendent to the foremen on the streets, supervision over the stock, supplies and orders that were placed. When I became assistant superintendent, my duties included more supervision of the actual jobs out on the street. That is, I went out occasionally observing

184 the jobs as they were working on them. I have had no mechanical engineering experience.

Kerosene is the fuel used in the type of torch exemplified by the blueprint, Plaintiff's Exhibit 7. I would say the diameters of the three wicks that were used in the torch would be about a half inch. I think the print would show that. Looking at the print now, I would say nearer to a quarter of an inch; my guess was wrong. In the outermost circle in the drawing in the upper right-hand corner of Exhibit 7 there is one shown to have a diameter of ¾ inch, and then there is one shown to have a
185 diameter of ⅝ inch, and then there is one showing a diameter of 11/32 inch. The smaller diameter would be the hole in which the wick fits, that is, the wicks were approximately 11/32 inch in diameter.

I never made any observations of the amount of wind or rain in inches per hour which one of these torches would withstand. They would, however, withstand a considerable degree of wind and an ordinary rain. It was only a drenching rain—a very heavy rain, that would extinguish a torch. I don't suppose we would have trouble with rain or wind putting out a torch more than once a month.
186 We use both the red lantern and the torch in conjunction today. Referring again to Plaintiff's Exhibit 9, and to the drawing with the umbrella mounted over the wicks, I have produced no drawing where a three-legged tripod was used to support the umbrella. The three legs positioned on the structure would be outside of the wick holes and spaced in between them; that is the way I remember it. This type of a cap over the wick was tested in rains; left them out in service. I have no means of stating what amount in inches of rain per hour they were subjected to. These particular

tests, about which I have just testified, were made, 187
I would say, around 1920 by the various foremen in charge of jobs. I saw the wicks in use, or the umbrellas in use, repeatedly. I was never present at any time in which one of these structures with the umbrella covering was extinguished in a rain. That always happened through the night time when the torches were out for protection, and we would get the report from the foreman the next morning. Those were the only reasons for which the torches would have gone out that I remember being reported. As far as anyone actually knows, somebody may have blown them out for a prank, that 188
could have happened, but doesn't sound plausible, I don't think. However, anyone could put one out.

I did not make any experiments with the extent of wick extension which was most efficacious. That was left pretty much to the man on the job, but my observation was that it was about a half inch of wick that would produce a good flame. I do not recall any experiments with reference to the distance between the top of the wick and the bottom surface of the umbrella. I think that originally those umbrellas stood up higher than the inch that is shown in this last drawing—probably two inches 189
or maybe three inches. But that is a matter of recollection. The diameter of the threaded bolt which supported the umbrella was 3/8 inch. I don't recall the name of the person who made this drawing, but the approval, I know that signature and name. That is B. B. Moore, office engineer, Detroit Street Railways. He is living.

The watchman's instructions were to keep those torches filled. They are cleaned and filled every day by the day watchman preparatory for the night work, the same as the lanterns are taken care of.

190 I wouldn't say offhand how much oil they hold. I would have to guess at it; it could be estimated from the measurements. They were filled by unscrewing the cap. That was unscrewed and the wicks adjusted and the oil was put in every day, after the night was over, and the night watchman picked up the torches and brought them in; then the day watchman's job was to clean them and fill them and get them ready for the next night again. Those experiments were always made at night, that is when the torches are burned, at night time. They were made all year 'round; we have work going on
191 winter and summer. Exhibit 9 is a complete assembly except that the wicks are not shown. I am not aware of any element of the structure which is omitted from this drawing.

I couldn't say what firm we buy our wicking from. Prior to 1913 we used the red lantern exclusively as a warning signal. I am not aware of any use of torches similar to the one that is shown in those two blueprints prior to 1914. I know that open flame torches are being used at the present time; whether they have a plurality of wicks or not, I don't know.

192 I never met Mr. Owen before coming in here today. Mr. Close called at my office about a month ago. He is the only man I have talked to about the case.

These structures are made by whoever happens to be the successful bidder on the castings. It may be a Detroit foundry, or it may be a Bay City foundry; we advertise them for open bids. We use these torches otherwise than in between the rails of the streets, we set them around the excavations on the pavement. The same type of low torch. We use only the low torch now; we have no

more of the high torches in use. The one that I gave Mr. Close is one of the old high torches. I was not able to observe from our testing of these torches whether there was any difference in performance when the umbrella was placed on the bolt centered between the three wicks, and when the umbrella was supported by the three-legged affair outside of the wick. My recollection is that with either type, the high wind or rain would extinguish them, so we discontinued using both types. Most of my information about their performance would be reported by the foreman in charge of the night work. 193 194

Redirect Examination by Mr. Owen:

The Witness: It was the duty of the foreman to report to me as superintendent. They report to me practically every day. These reports came to me in the regular course of their work. They were sometimes verbal, sometimes written. This umbrella was used on the high torch—that is where it was tried out. Referring to Exhibit 9, it is 3⅛ inch diameter of umbrella by ⅛ inch thick, and it was made out, as I remember it—just cut out of ordinary ⅛-inch steel plate and drilled to fit the carriage bolt; held in place to fit the head of bolt. I will indicate on Exhibit 9 by small circles where the three studs were located which were used to support the umbrella. Approximately, as nearly as I can remember, it would be in a position between the wick openings and somewhat outside the circle of the wick openings. I have indicated those locations by an X mark with red pencil. I do not remember what size bolts were used for those three supports. 195

196 *Recross Examination by Mr. Wisner:*

The Witness: A torch such as shown in the lower left-hand corner of Plaintiff's Exhibit 9 was made. We experimented with the umbrella and we used the torch, but when we used the umbrella on the torch it was the deeper torch, it was the 8-inch deep torch. But the method, umbrella method, and appliance, was the same as we experimented with. We have not in this low torch used the umbrella, although the idea was carried over from the original, as shown on the drawing.

197 I couldn't say offhand how many of such structures with the umbrella were made, but there would be quite a few, because the ordinary opening probably takes twenty torches to guard it, and we have many openings, depending on the various times of the year—I would guess that probably one hundred to two hundred probably were fitted that way. These written reports I referred to were preserved in the file of the superintendent's office. They went with the D. U. R. Those records all disappeared with the going out of business. All of this was prior to the taking over of the railroad

198 by the city of Detroit. We were experimenting with the umbrella about 1920; it was previous to the time the city took the D. U. R. Lines, which was May, 1922. I do not remember any of the reports disclosing what time of night the torches were extinguished. I don't remember that now. It might have been at any time during the night. The torches were ordinarily lit about dusk; that would depend on the season of the year.

(Certificate of notary omitted.)

DEFENDANT'S CASE 199

Mr. Wisner: I handed up to Your Honor a certified copy of the opinion of the Circuit Court of Appeals.

(The opinion was received in evidence and marked Defendant's Exhibit A.)

Mr. Wisner: I now offer in evidence as a defendant's exhibit a photostat comprising enlarged drawings taken from the patent specifications of the patent in suit, of the Rutz Patent No. 1,101,146, relied upon by the plaintiff; of the Russian patent to Malcov of the 200
year 1868, No. 1163, and a figure of the defendant's burner.

(The drawing was received in evidence and marked Defendant's Exhibit B.)

Mr. Wisner: I offer in evidence as a defendant's exhibit a volume of patents.

(Marked Defendant's Exhibit C in evidence.)

The Court: Which of these are anticipatory patents?

Mr. Wisner: Some of them are state of the art patents. The anticipation patents which 201
we cite are very few, about four or five.

The Court: Argand, Salsbury, Rutz, Van Liew, Warren, Malcov, Almond, Blake, Kahn, Heston and Hathaway, those are the patents?

Mr. Wisner: That we rely on as anticipation.

The Court: What did you say your best reference was yesterday?

Mr. Wisner: There are three, Rutz I consider one of the best references, Malcov, the Russian patent of 1868, No. 1163, and Argand,

202 of July 3, 1784, No. 1425. It is the Argand specification, there are no drawings.

Mr. Wisner: I offer in evidence as Defendant's Exhibit D, a bound volume of the photostatic reproductions of the pages relied upon on page 5 of the answer in anticipation as publications.

(Marked Defendant's Exhibit D in evidence.)

I offer in evidence as Defendant's Exhibit E a stipulation with reference to the testimony of Oscar J. Leins, of Milwaukee, Wis-
203 consin. Notice of the taking of this deposition was served on January 12, 1938.

(Marked Defendant's Exhibit E, in evidence.)

Mr. Wisner: In connection with the deposition, I offer in evidence as a defendant's exhibit the curves for all of the graphs curved by Professor Croft, disclosing the nature of the performance of these various devices in the tests which he made.

(The curves were received in evidence and marked Defendant's Exhibit F.)

204 Mr. Wisner: I now offer in evidence stipulation with reference to the tests taken after the taking of the deposition, and stipulation with reference to the test experiences which has been entered into between plaintiff and and defendant on March 3, 1938.

(Marked Defendant's Exhibit G in evidence.)

Mr. Wisner: I offer the deposition of H. O. Croft, taken January 18th and filed January 28th.

(Marked Defendant's Exhibit H in evidence.)

MATTHEW LUCKIESH, called as a witness on be- 205
half of the defendant, having been duly sworn, testified as follows:

Direct Examination by Mr. Wisner:

Q1. State your name and residence, Doctor. A. Matthew Luckiesh, Cleveland, Ohio.

Q2. What is your occupation? A. I am the Director of the Lighting Research Laboratory of the General Electric Company at Nela Park, Cleveland.

Q3. What has been your educational prepara- 206
tion with reference to this work? A. I have a number of degrees.

Q4. That is, from universities? A. Yes.

Q5. Has your work anything to do with light and lighting equipment? A. Entirely.

Q6. Have you written any books with reference to such matters? A. Quite a few.

Q7. Do the names of any of them readily occur to you? A. Artificial Lighting, Its Influence on Civilization, Lighting Art, Lighting Fixtures, and Lighting Effects, Science of Seeing, and so forth.

Q8. Have you had anything to do with the his- 207
torical aspects of lighting? A. I have always been interested in it, and of course, we have had to know the background.

Q9. In your preparation for testifying in this case did you first familiarize yourself with the devices involved? A. Yes, sir.

Q10. Within what classification, roughly, in the lighting art, would you place the product of the Toledo Pressed Steel Company, Plaintiff's Exhibit 19? A. A rather primitive light source, similar to those of centuries ago.

208 Q11. It might be classed as a chimneyless hydrocarbon burner, might it not? A. Yes.

Q12. What sort of fuel does it use? A. Kerosene, signal oil, and similar things.

Q13. What are the means used for transferring the oil from the reservoir to the level of the flame? A. The common wick.

Q14. As the oil reaches the top of that wick through capillarity, through what process does it pass before it gets into the condition of lumination? A. It is vaporized by the heat of the flame and burns as a vapor.

209 Q15. What is the principal source of heat which vaporizes it? A. The flame.

Q16. And would that be true whether or not there were a protective housing for the wick? A. Yes.

Q17. Can you explain very briefly the reasons why a flame of this type gives light, that is, a hydrocarbon light? A. In general there are carbon particles in the flame that are heated to incandescence, and they give off light.

Q18. What happens to these carbon particles after they reach incandescence? A. They may be
210 partially burned, some of them may not be burned, and they can go off as soot or smoke and settle on nearby surfaces.

Q19. Directing your attention now to Fig. 1 of the drawing on the easel, that is the Toledo device, will you point out on what surfaces the soot of which you have just spoken would be deposited? A. On this device the natural place would be inside of that top and around the air ports chiefly. Of course, I cannot conceive of any part of that surface, interior surface, not receiving soot eventually.

Q20. Ordinarily what effect does the burning process have on the wick? A. When the wick is not too generous it has practically no effect, as we know from our experience, of course, with millions of kerosene lamps and similar devices. 211

Q21. Will you explain what you mean by "generous"? A. When they pull the wick out an inch and a half you have got practically a bonfire of cotton fibre.

Q22. Will you direct your attention to Plaintiff's Exhibit 13? A. Yes. If you want to burn up some waste of cotton, that is the way you would do it. Whereas, if you want to conserve the cotton, you would saturate it with oil and keep it saturated and burn the oil rather than the cotton. 212

Q23. What are the concepts which enter into any structure adapted to burn a hydrocarbon fuel? A. It will receive an adequate supply of air and an adequate supply of fuel.

Q24. In your earlier study of the lighting art, have you familiarized yourself with the means which have been used to associate these two concepts, and in what sort of structures? A. Yes, sir.

Q25. What means, if any, do you find in the structure appearing as Fig. 1 on the plate of drawings which have not been well-known in the art of lighting devices? A. I see none. 213

Q26. Are you familiar with the British patent to Argand No. 1,425 of 1784? A. Yes, sir.

Q27. How long have you known of that patent? A. Twenty-five years.

Q28. What relation, if any, does the Argand patent bear to the lighting art? A. It is the first real scientific presentation of the principles necessary for good combustion and protection of light by flames. It is the forerunner, in a sense, in a

214 rather big sense, of all flame sources, or many of the flame sources that follow.

Q30. Are you familiar with any devices prior in date to the patent to Argand, in which means were used in some form or other for protection or partial protection of the flame from the elements? A. A great many of them more primitive, way back in the centuries, many centuries.

Q31. You have from time to time observed the operation of devices such as those exemplified by the device of the patent in suit? A. I have.

Q32. Have you had any experience with lighting
215 highways and light protection on highways? A. A great deal in all of its aspects, all the aspects of highway lighting and safety lighting, such as traffic aids, traffic signals, highway lighting, head lamps for automobiles, and even emergency lights.

Q33. If, as you say, an open flame light is so primitive, can you assign any reason why, prior to the patent in suit, the bonfire construction with an open and unprotected wick should have continued in use? A. The growth of artificial lighting of course was largely in an interior world, and there had to be improvements made from the true
216 flame source on account of such nuisances as odor, flickering, soot, and so forth. Those same things had to be done outdoors for street lighting as was done in many of the devices to protect them from obvious things like rain and wind. And this is the last vestige of the primitive source in civilization. It stayed outdoors, was used in construction work and on highways, and occasionally in big interiors for emergencies because it was in a sense good enough, and has been used as a lighting device in that way for use outdoors for many years.

Q34. Now, directing your attention to the series

of photographs opposite page 56 of Luckiesh on Artificial Light, have you seen the devices which are shown on that page before, or devices similar to those? A. Yes, many of them. 217

Q36. Where did you procure those particular photographs when you were preparing the book? A. From museums and private collections.

Q37. In reference to the Argand patent, which issued in 1784, did any of the devices disclosed on that page antedate that patent? A. They did certainly antedate Argand by centuries, some of them.

Q38. In any of the devices shown on that page do you find an application of the concepts of protecting an open flame from the elements? A. It is, a metal enclosure with holes punched in it was a common way of protecting a flame from winds and rain, still leaving a little light to get out. There are one or two more on that page not quite so primitive, but very obviously protections against rain and wind. The lighting art is full of those illustrations. 218

Q39. None of them go so far as Argand, however, to specify surrounding and enclosing the flame with a metal chimney, dome, tube, or some such structure as that, do they? A. No. Argand's was a real scientific approach to the problem. 219

Q40. From your examination of the Argand specification, and comparison with the structure of the patent in suit, do you find any concept disclosed in the structure of the patent in suit which is not present in the Argand specification? A. No, I think that Argand more than covers that of the Withrow device that you are referring to.

Q41. I now direct your attention to pages 14 and 15 of a book by W. H. Davenport Adams on "Lighthouses and Lightships." Can you describe

220 the operation of the structure shown in the upper portion of page 15? A. The upper structure is a housing with a top and some openings on the side in which crude fuel is burned, the side ports both admitting air and letting light out; the little openings below that first platform from the top, or rather, the top platform, and the larger ones below, were commonly used to let some air and draft up to the base of the fuel. There are a number of drawings of this sort on record, and they are rather crude, but the description fits that appraisal.

Q42. Would you explain the functions which the
221 top ports of this structure perform? A. To protect the flame or the burning material obviously from rain, and some partial protection from wind; likewise letting out the light. It is like a flare on a large scale, used on the highways of the sea, as we use the little flare on the roadways.

Q43. I will direct your attention to plate 48 from "Das Beleuchtungswesen," and more particularly to Fig. 113, I believe that is the last one in there, on the next to the last page of plate 48.

Q44. What function would that particular device perform? A. That very obviously protects the
222 burning material from rain. The side ports were also flame ports to let light out and air in, the flame out on the windward side. It performed all the functions of the modern cap.

Q45. What would be the date of that device as contrasted with the Argand patent which issued in 1784? A. It is my opinion it would be centuries preceding Argand.

Q46. You have seen examples of such devices in museums? A. Museums claim them 'way back, many centuries ago.

Q47. Have you examined the patent in suit to any extent? A. Yes. 223

Q48. I wish to direct your attention to line 5 of page 1 of the specification and to line 10. In each of those lines the word "efficiency" is used. What is the meaning of the term "efficiency" as applied to lighting devices? A. "Efficiency" as applied to lighting devices is the same as, analogous to the efficiency of a motor. For lighting devices it is the light output per unit of energy input, and that energy input in an electrical device is measured in watts and watt hours, and in the case of an oil burner in the number of pounds of kerosene 224 per hour. So the efficiency of an oil lamp is the light output in some acceptable unit, per pound of kerosene burned per hour, or any other acceptable unit of measurement.

Q49. Is there any other basis for measuring the performance of a lighting device? A. There is no other way of measuring the efficiency of a lighting device than that. I would rather answer it that way. There are other ways of measuring performance, but the ultimate performance of a lighting device that uses energy that one must pay for and that gives light that is discharged and needed, it 225 is measured only by the light output per unit of energy input, or in this case kerosene burned per hour.

Q50. We shall from time to time during the course of this examination refer to the term "efficacy." What meaning has that in the lighting art? A. Efficacy is quite a different matter than efficiency. The efficacy of the light source from the viewpoint of the user, let us take a flare, a warning signal on a highway, it must be efficacious if it gives enough light to be visible under given conditions.

226 Now, if you asked a truck owner he would probably admit that that was one definition of "efficacy," and he would also be concerned, to him it would be efficacious if it gave enough light at a reasonable fuel consumption, and to him it would be more efficacious if it gave that same amount of light with less fuel consumption.

So we really come back, in thinking of efficacy, we come back inevitably to efficiency, the amount of light you get from the fuel that you pay for.

Q51. Referring again to the patent in suit, and particularly to lines 63 to 67, you have a copy,
227 have you not, Doctor? A. Yes.

Q52. Of page 1, of the specification, reading as follows: "The function of the disc 11 is to prevent the air entering the inside of the cap 7 from cooling the wick W to such an extent that the temperature of the oil passing up the wick is reduced below the desired point." What relation does the operation there described bear to fuel consumption and efficiency? A. In general, if, as a contribution the oil is heated up more in one device than another, in one condition than another, it can't result in anything else than a greater fuel consump-
228 tion, other things being equal.

Q53. Have you given any thought and study to lines 68 to 100 on page 1 of the patent specifications reading as follows:

"When the outer end of wick W is lighted the oil passing up the wick by capillary action is heated, thereby maintaining the oil in the region of the outer end of the wick at the proper flashing point. This heating of the wick is facilitated by the reflection of heat from the dome-shaped cap."

What is true or false about that statement? A. The reflection of heat from the inside of that dome

or cap, that inner surface. After that device is in 229
operation for a few minutes it is sooted up here, covered with loose soot, and it cannot possibly reflect any appreciable amount of energy or heat.

Q54. You are pointing in your answer to Fig. 1 of the sheet of drawings, the Withrow device? A. That is it.

Q55. Exhibit B? A. You read from the patent.

Q56. Yes. What type of surfaces form competent heat or energy reflectors? A. To state it popularly, not exactly, as a rule the thing that reflects quite a lot of light usually reflects quite a lot of heat. That isn't always true. Stating it on the 230
other side, there is one thing we do know and can be absolutely certain of, and that is that carbon black, loose black, which is called a black body in science, it is used for many scientific purposes because it reflects no appreciable amount of energy, radiant energy. It will absorb practically all of it.

Q57. Can you express in percentage points the approximate amount of heat or energy the cap 8 of Fig. 1 would reflect? A. The actual sooted surface there would reflect not more than two or three per cent.

Q58. Of the heat which it received? A. Of the 231
radiant energy.

Q59. Again calling your attention to the specification of the patent in suit, and particularly to lines 78 to 86, reading as follows:

"Air inlet openings 10 being above the lower edge of the cap leaves a space within the cap and above the flange of the wick holder for comparatively quiescent air. This quiescent layer of air in contact with the wick holder and the restriction of inlet ports to admit to the wick and holder only such air as is needed for combustion aids in maintaining the heat of the wick holder and wick."

232 Have you formed any opinion about the existence of that layer of quiescent air in the structure of the patent in suit? A. It may be reasonably quiescent in the state of zero wind velocity, but it is inconceivable that you could describe that as a layer of quiescent air when there is any wind velocity above practically zero.

Q60. You have examined the patent to Malcov, Russian patent No. 1163 of 1868? A. I have.

Q61. And are familiar with it and its specification? A. Yes.

Mr. Wisner: I offer in evidence as Defend-
233 ant's Exhibit I a model taken from the patent drawings of the Malcov structure.

Mr. Darby: I have no objection to the model being marked in evidence. I do object to those characterizations. I understand that you offer this as illustrating what is shown in the Russian drawings, and as applied to a burner body, flare body. I accept it for that purpose.

Mr. Wisner: You are correct.

(Marked Defendant's Exhibit I in evidence.)

Q62. What was the effect of the device disclosed
234 in the drawings of the patent to Malcov and exemplified by Defendant's Exhibit I? A. This upper surface certainly protected the flame from rain. These openings partially protected the flame from wind, as any partial enclosure will do.

Q63. Does the device contain a wick? A. Yes.

Q64. Do you find a wick tube in the structure? A. Yes.

Q65. A torch body? A. Yes.

Q66. Also a dome-shaped cap? A. Yes.

Q67. Do you find any flame openings? A. Yes.

Q68. What means, if any, were used for the ad-

mission of air? A. Air had to come in the flame ports, of course, probably quiescent air would come in at the bottom, and as soon as there is a breeze, as in the case of these other ones, the windward flame ports become air ports and the leeward ports become flame ports. 235

Q69. According to the translation of the Malcov specification, and to that portion thereof which reads as follows: "Fig. 2 shows the regulator which is longer than the tube shown in Fig. 1. In the upper portion of the regulator cemented with red copper are provided perforations designated in the drawing by dots. The upper portion of the regulator on both sides is traversed by two arcs DD connected with ring C, but not constituting an essential part of the burner. These arcs are arranged for the purpose of heating the regulator and transforming the liquid into gas." 236

What would be the operative effect of two arcs DD, as shown in Fig. 4 of the drawing, Defendant's Exhibit B? A. Of course, heat would be conducted from this steel surface down to this ring, and eventually through the wick tube to the wick, just as it is in all kerosene devices, kerosene lamps. 237

The Court: Do you get some light just from those holes in the top?

The Witness: They appear to be very small in the drawing.

Mr. Wisner: The patent drawing shows flames coming out all over the thing.

The Court: I understand that, but I was just asking whether there would be any light from the top.

The Witness: Not appreciably.

Q70. Now, referring again to the specification

238 of the patent in suit, and particularly to line 75 on page 1,—

The Court: With those holes in the top, of course, there would not be as much protection against rain as there would be in Fig. 1?

The Witness: That is the Toledo flare, the Withrow patent?

The Court: Yes.

Mr. Wisner: Can Your Honor see that?

The Court: Yes.

The Witness: Of course, small holes, as we know by experience in punching holes in
239 tin cans, do not admit much rain, that is, particularly when it has a sloping side; because of the surface tension the drops of water can't get through the hole.

The Court: The holes are rather small. Are those holes described in the patent, the size of them?

Mr. Wisner: It does not describe them, may it please the court, it says, "In the upper portion of the regulator," this whole thing is called the regulator in the patent, "are provided perforations designated in the drawing
240 by dots." So they must be very small.

The Court: Yes.

Q71. Referring back again to the specification of the patent in suit, and to lines 75 to 78, where it is explained that heating of the cap conducts heat to the wick holding collars 12 and 6 from their supporting flanges, flange 11 receiving reflected heat and being in contact with the lower edge of the heated cap, do you find that concept in the Malcov patent specification? A. Yes, a path of metal down to the wick tube. That is true of every kerosene device that has a holder around it. You cannot avoid that, it is fundamental.

Q72. Are you aware of any written descriptions or disclosures of this heating of the wick tube about which you have been interrogated? A. I have run across a good many of them in the literature, I think there is the sentence in that book of mine. 241

Q73. Directing your attention to page 60 of Luckiesh on Artificial Light, where it says as follows:

"In the modern oil lamp the rush of air due to the pull of the chimney is broken and the air is diffused by the wire gauze or holes at the base of the burner, these metal parts being hot also serve to warm the oil before it reaches the burning end of the wick, thus serving to aid vaporization and combustion." 242

That was included by you in your book, that was not a new concept when the book was published? A. No.

Q74. You will notice in the specifications of the patent in suit, that it was first described as a structure being made of steel. In the event that it became desirable to conduct heat to the wick tube, what materials would suggest themselves to you as being more efficacious? A. If I would take advantage of whatever they would give me, I would use copper. That would be about nine times as great as the conductivity of steel. 243

Q75. And that is the difference in the character of the two metals, which is well known? A. Yes.

Q76. Now, have you observed in operation as a torch of the structure in evidence, Defendant's Exhibit I? A. I have.

Q77. And under what weather conditions did you observe that? A. A several mile an hour wind and it was snowing.

244 Q78. Heavy or light snow? A. Light snow.

Q79. And how did it burn? A. Very well.

Q80. And in connection with your preparation of this case, you are aware of certain researches conducted at the University of Iowa? A. Yes.

Q81. And you were not present at any time during any of the tests which were made? A. No.

Q82. Have you anything to do with research methods, and are you familiar with them? A. I have spent my 27 years associated with them and devising them and correcting them.

Q83. And that is in connection with your work
245 with the General Electric Company? A. Yes.

Q84. Have you had anything to do with methods used in this research? A. I collaborated on the program of a research approach and it was carried through.

Q85. You have examined the data submitted by the testing engineers? A. Yes.

Q86. I now direct your attention to Figure 35 of the graph of Exhibit F. A. I have it.

Q87. What does that graph tell us about the relative efficiency of the structure of the patent in suit with and without the burner cap 8? A. That
246 shows—

Mr. Darby: Just a minute. I object to that, Your Honor, as incompetent, irrelevant and immaterial. I do not think that it is of any issue in this case.

The Court: Well, I will take this testimony, but I do not think myself that this point seems much of a basis of comparison. Mr. Witness, you may proceed.

The Witness: That wick is three-quarters of an inch in diameter (indicating an exhibit). Why wasn't it one-quarter of an inch in diameter, why

was it three-quarters of an inch in diameter? Why not compare the quarter-inch wick sticking out 1½ inches, in that black bomb, with that particular device? There is no fundamental way of comparing, if you use the open torch. The only way you arrive at a fundamental is control of all variables except one. The only way you can get basic, foundational information on the effect of a cap on efficiency is to test it on and off of a given device. That is the research approach. There is no other way. 247

The Court: Have you used that device without any wind, with the wick up ⅛th of an inch—in a wind would you use it ⅛th of an inch? 248

The Witness: You mean open?

The Court: Yes.

The Witness: I don't think so, but there is no data indicated that you need 1½ inches either.

The Court: What would you say you would need?

The Witness: From what I know now, I would take a chance on a half an inch.

(Question 87 was read by the reporter.) 249

A. This shows within the limits of error of data that that device, with a flame guard, always has a lower efficiency than when it has no flame guard, that is, for velocities from zero to 12 miles an hour.

It also shows that the efficiency in zero wind and very low velocities, under a mile an hour, is extremely low.

Q88. And where are these torches usually used, Doctor? A. On the ground, so they act as a light source, of the order of 5 or 6 or 7 inches above the ground.

250 Q89. Have you given any study to wind velocities at any time? A. Oh, yes, it happened that I had a good deal of flying during the war and I found out that wind velocities increased with height. I gave a lecture on aerodynamics along those lines, and I have had in my mind pretty well velocities. We know that the earth produces a drag, that is the movement of the earth produces a drag on atmosphere, and velocities close to the earth's surface are much lower than at a height.

To refresh my mind, I asked Mr. Mize, the chief meteorologist of the Cleveland station of the United
251 States Weather Bureau, to find me the latest data for representative parts of the whole United States, and he sent down to me, to check my memory—

Q90. A document on the form of the United States Department of Agriculture, Weather Bureau? A. Yes.

Q91. And what does this document show about wind velocity two feet from the ground? A. These were taken at evaporating stations where they keep the anemometer two feet above the ground. At two feet above the ground the average annual
252 velocity for seven evaporating stations over the country, pretty well scattered, was about two miles an hour, at two feet.

Now, he also gave me the data from the Weather Bureau station in the vicinity of the evaporating stations. Those stations have their anemometers about 50 to 100 feet above the ground, and even at 50 to 150 feet above the ground, the average velocity, in the clear, on the anemometers used, was only 8¼ miles an hour at an average height, say, of 100 feet.

Q92. Can you state, based upon the information

which you have, what wind velocities will be at about 6 inches from the ground, on the average? A. Well, if the average annual velocity is of the order of two miles an hour, two feet above the ground, I should state that the estimate for 6 inches above the ground would be of the order of one mile an hour, and the actual data on record show very few yearly averages at 2 feet above the ground that are more than 2 or 2½ miles an hour. It would be my estimate that it would be a safe contention that at 6 inches above the ground the average wind velocity over the entire year, averaged over the United States where the Weather Bureaus are, would be less than a mile an hour. 253 254

Q93. What, in your opinion, is a fair basis for testing the performance of one of these flares such as Plaintiff's Exhibit 19? A. Well, you learn something definite and fundamental with zero wind velocity. That is a basic approach that anybody skilled in research would make. Then if we were only going to make one more test I would say that it ought to be an average velocity, maybe one or two miles an hour, or we might extend it to double that. Now, if we could not have a high efficiency and good operating characteristics as a light source over the entire range, it is perfectly obvious, from the standpoint of design, that it should be designed for high efficiency and high efficacy over the miles an hour wind velocities found most of the time. 255

For example, a 20-mile an hour wind could only blow ten per cent of the time if all the rest of the time the wind was absolutely still, in order to get an average of two miles an hour. If we wanted to take an average of one mile an hour, a 20-mile an hour wind could only blow five per cent of the time with the air still 95 per cent of the time, to have that average.

256 In my opinion, to remain efficacious the operating characteristics of a device like this, from the standpoint of the user, particularly the fuel purchaser, should be within a range of say zero to five miles an hour or zero to two miles an hour; in that low range.

Q94. Referring again to Fig. 35 of Exhibit F, purporting to be a graph of efficiency, will you translate into ordinary terms the factors which were taken into account as disclosed in that graph? A. Well, candle power is one way of measuring light output in a crude usage of this sort, where it
257 is generally horizontal. That is the mean horizontal candle power—that is, that is what was measured. When we say illumination, that means illumination at one foot and it is taken that way because we may have a one-foot candle at one foot, and we know we have one candle power source here. Of course, fuel consumption, pounds of kerosene per hour, is taken and divided by the other, and the result is efficiency.

Q95. How was efficiency calculated by one being divided by the other? A. By the light output and some acceptable term of kerosene consumption per
258 hour.

Q96. Drawing your attention to Fig. 36 of Defendant's Exhibit F, what are the variables shown in that particular graph? A. Fuel consumption is the ordinate against air velocity.

Q97. What does that graph show? A. That shows, with the exception of actually still air and velocities below 12 miles an hour, the fuel consumption is actually increased with the flame guard, as it should be; it is actually increased by the flame guard.

Q98. Now, directing your attention to Exhibit

37, what were the variables taken into account there? A. That is measuring the illumination at one foot, measuring the foot candles, but that can also mean candle power in that direction. 259

Q99. What does that show about operation of the Toledo structure, in very light air? A. In very light air it emitted practically no light. Putting it in visualizing terms, the candle power was less than one-tenth from that which you would get from a lighted match.

Q100. Will you explain what that instrument is that you have, Doctor? A. This is just a little electro cell, sensitive to light. This is read in foot candles. Here we will have to have a little light naturally. Now I am going to hold this match one foot away, that would make it go up one division. At six inches it should make it rise about four foot candles. (Witness demonstrating with lighted match.) That would give you roughly the equivalent of one-tenth of a match. 260

Q101. Observations were also taken with the wick extended to one-eighth of an inch, as recommended by the plaintiff? A. Yes, with the same curve.

Q102. Under what conditions of wind will the patent and its air ports operate as described in the specification, the air ports being marked 10 on Fig. 1 of the drawing? A. Only in the conditions of no wind, that is, still air, will these be air ports (indicating), there being a draft up there from these air ports and out the flame ports. As soon as we have a movement of air horizontal, as is usually the case, these air ports push the air in on this side and pull it out this side (indicating) and we get the velocities that are measurable more than zero, and when we get such velocities this becomes 261

262 an air port (indicating) and that becomes a flame port. (Indicating.)

Q103. By air port you mean an orifice indicated by 9 on Fig. 1 of the patent drawing? A. Yes. In a wind they cease to function as an air port. We found by test that these did not supply enough air apparently at zero wind. That was responsible for the extremely low candle power. If they do not function at zero wind they are not needed for any winds above it because the flame ports become air ports automatically.

Q104. You are now referring to the air ports
263 which are marked 10 on Fig. 1? A. That is right.

Q105. And you are familiar with the patent to A. O. Rutz, a device of that type exemplified by Fig. 3 of the plaintiff's drawing, Defendant's Exhibit B? A. I am.

Q106. What function is performed by the shell 13? A. In the Rutz patent?

Q107. Yes. A. Shell 13 obviously and actually protects the flame from spilled liquids and protects from gusts of wind, air velocities, we will say, and has ports through which the flame emerges.

264 Q108. Disregarding the supposed operation of the structure of the patent in suit as an efficiency increaser, is there any functional difference, so far as protection is concerned, between the Rutz patent and the patent in suit? A. None at all in principle.

Q109. They should be interchangeable? A. They should.

Q110. I hand you a device consisting of a torch body with a superstructure, and I ask you whether you have ever seen that particular device before? A. Yes, I saw that device in operation.

Q111. You observed it operating as a flare? A. Yes. 265

Q112. What sort of a flame guard is on that particular device? A. It is actually of the Rutz device, similar to those used on my gas stove at home.

Q113. Similar to Fig. 3? A. Similar to Fig. 3.

Q114. Under what weather conditions was it operating? A. There was about a four or a five mile wind, I should estimate, and it was snowing and when I applied all the wind I could apply, I was surprised to find that I could not blow it out.

Q115. How did you finally put it out? A. By the snuffer. 266

Q116. You placed the snuffer cap and you placed it over the structure? A. Yes like this. (Indicating.)

Q117. Directing your attention, Doctor, to the Anthes structure shown in Fig. 2 of Defendant's Exhibit B, what, if any, similarity do you find between that and the Rutz structure shown in Fig. 3? A. It is quite similar in principle. There is an enclosure with an imperforate top, it has flame outlets, it has metal connecting, as all devices, all oil lamps, have, as a rule they have, connecting to the wick here, and of course in this case to the 267 tube, and then it has air ports in the bottom, just as the Rutz patent.

Q118. Have you any opinion as to the desirability of placing air holes in the bottom as Anthes and Rutz have done? A. We know as a matter of experience with kerosene lamps that we have put them there and kept them in the bottom, and that that is the best position with quiet air, that is the natural place, the desirable place for them, because you get an upward draft.

Q119. You are now pointing to the Anthes Fig.

2? A. Yes, Fig. 2. The air port 6 is getting the
268 natural upward draft, so it is desirable, as shown by Argand rather scientifically, and as we have observed the course in oil lamps for years; it is the efficient way to get oxygen or air to the flame.

Q120. Are you familiar with the British patent to Salsbury No. 16,524 of the year 1925? A. Yes.

Mr. Wisner: I offer in evidence as Defendant's Exhibit J a structure prepared from the patent drawings of Salsbury.

(Marked Defendant's Exhibit J in evidence.)

Q121. Now handing you Defendant's Exhibit J,
269 you have seen that structure before? A. Yes.

Q122. Where are the air ports positioned in that particular structure? A. They are in the bottom and sides, both.

Q123. Both. Have you observed that device in operation? A. I have.

Q124. Under what weather conditions? A. Under weather conditions of a wind velocity of a few miles per hour and a moderate snow storm.

Q125. How did it function as a flare? A. It functioned very well.

Q126. Did you make any attempts to blow it
270 out? A. I did.

Q127. From what direction did you blow? A. From a horizontal position; I was unable to blow it out. It was blown out rather readily when you blew down on the top of it.

Q128. Is that the usual direction of a wind? A. No, it is usually horizontal.

Q129. Tell us, there has been some mention in the patent specification, particularly in lines 80 to 83, of what they term a layer of quiescent air. Do you find any such feature in the Anthes device, Fig. 2 of Defendant's Exhibit B? A. No.

Q130. That is true, is it not, under any conditions of operation? A. That is true under any conditions of operation, there couldn't be a layer of quiescent air. 271

Q131. There is likewise some mention in the patent specification of a heat-receiving flange identified as the flange 11. Do you find its equivalent in the Anthes structure? A. Not any surface specifically designed for the purpose. Of course, any surface of a housing surrounding or partially surrounding a flame is bound to receive heat radiated from the flame.

Q132. That is true, is it not, of all lamp structures in which an open flame is used? A. All sorts of kerosene lamps, there is no way to avoid that if you wish. 272

Q133. What do you say as to whether or not there is any functional difference in the positioning of the air holes in the bottom of the flange as against their being positioned in the side? A. In a condition of zero wind or relatively still air, it is the very logical place. The air, provided it has an opportunity, will go right on through here, whereas, for example, if it is on the side, the air must turn rather a sharp corner. Air does not like to turn sharp corners. 273

Q134. I hand you Plaintiff's Exhibits 33 and 34, purporting to be the structure shown in the Bolser case. Will you point out on those exhibits in what position the air holes were or the air inlets are to be found? A. In Exhibit 33 the air ports are apparently in the side, as in this case.

Q135. You are referring to Fig. 1? A. As in the case of the Withrow device, Fig. 1 of Exhibit B.

Q136. In the other exhibit which you are shown what is the fact? A. The fact again appears to

274 be that the air ports are in the sides as in the case of the Withrow device or Toledo flare illustrated in Fig. 1 of Exhibit B.

Q137. Did you prepare any statements showing a comparison of the operation of the Anthes or defendant's flare with that of the patent in suit? A. From rather voluminous data I condensed it to a table of average efficiency. In the tests—

Mr. Wisner: Just a moment. I offer in evidence as Defendant's Exhibit K, a statement entitled "Comparison of Performance of Plaintiff's Flare with and without Flame
275 Guard, Comparison of Performance of Plaintiff's Unprotected Flare at Various Wick Heights, and Comparison of Performance of Plaintiff's and Defendant's Flares."

Mr. Darby: Just a minute. Could I see that, please?

Objected to as irrelevant and immaterial.

The Court (to the witness): You take certain winds—

The Witness: With the condition of no wind, a 1/8th inch wick, the Anthes efficiency is about 20 times greater than that of the To-
276 ledo device—the efficiency.

Q138. Will you point out the reason for that? A. The chief reason being while the consumption of kerosene burned per hour is roughly twice as great in the case of the Anthes device, as compared with the Withrow device, the candle power in this device is of the order of a ratio of about 200 to 4, that would be 50 to 1, roughly. This candle power is of the order of 1/50th of this (indicating), and even though—

The Court: And by "this," you speak of what?

The Witness: The Withrow device. It is 277
1/50th of that in the Anthes device. Nevertheless, the Anthes device burns about twice as much kerosene per hour as the Withrow device, and the net ratio of candle power output to kerosene input is about 20 times greater for the Anthes device than the Withrow device. In other words, the Anthes device is 20 times more efficient as a light producer.

Q139. You argue from that that the devices are different? A. That they must function differently to get the ultimate result.

The Court: I am inclined to agree with 278
you, Mr. Darby, that this is not material. But in cases of this kind where there may be some question about it perhaps it is better to allow it, if it isn't going to involve the taking of too much testimony—

(Marked Defendant's Exhibit K in evidence.)

Q140. Will you further point out the operative differences between these two structures, Doctor? A. You mean in this table?

The Court: Hasn't he already done so?

Mr. Wisner: He only referred to the still 279
air condition.

A. He wants me to proceed with the table.

The same results were obtained with quarter-inch wicks and three-eighth-inch wicks. I do not need to repeat the data; they were the same general results; as we got to a wind velocity of around two miles per hour the efficiency of the Withrow and Anthes devices are approximately equal, instead of having been twenty times greater in the case of Anthes over Withrow.

280 The Court: They are about the same at two miles an hour?

The Witness: Beginning at about two miles an hour, their efficiency becomes about equal, with the wind blowing two miles an hour.

The Court: When you are speaking about efficiency, you are speaking about light?

The Witness: Light production, the candle power per unit of kerosene, blowing at two miles an hour. As we pointed out, the candle power of the Withrow device is about one-fiftieth or fortieth, about one-fortieth that
281 of the Anthes device. We talked about the efficacy, but there is no flare in existence that is capable and adequate as a warning signal in a tremendous pea-soupy fog. So the reduction of candle power per unit of kerosene or per device is a very important matter. There are no ascertainable limits as to the candle power we need, so there is no virtue to produce one candle power or the equivalent of one-tenth of a candle power, as we saw this morning, because in still air it might be visible at 500 feet, or in clear air; we have all kinds
282 of conditions. The real purpose of a light source is to produce as much light as you can produce per ounce or per gallon of kerosene.

Mr. Owen: May I inquire whether these tables which are being considered by the witness are based upon the Croft tests?

Mr. Wisner: I thought I made it clear that they were.

Mr. Owen: I did not understand; they were not tests that he made?

Mr. Wisner: No, they are simply taken from there.

The Court: You gentlemen haven't agreed on a definition of efficiency. 283

Q142. Will you give the definition again? A. There is only one fundamental definition of "efficiency," that is the ratio of output to input, no matter what kind of a device it is. In this case the output is light and the input is kerosene.

Q143. Is it a fair test, in your opinion, Doctor, to compare the efficiency of the structure represented by Plaintiff's Exhibit 19 with the structure represented by Plaintiff's Exhibit 10? A. No.

Q144. From a comparison of these exhibits, can you give me any scientific determination of the effect of the addition of the burner cap 8 on Exhibit 19? A. You can make no comparison unless you keep control of all variables but one. In comparing the effect of the cap you must take it on or leave it off the same device and find out the effect by controlling all variables that are controllable, with the exception of the cap. To compare it with that other torch— 284

Q145. You refer to Exhibit 10? A. Exhibit 10, you are not comparing it with the prior art properly and appropriately and adequately represented. That is just one instance of the prior art. There is nothing fundamental about that particular torch with a three-quarter inch diameter wick and an inch and a half extension, and other details. 285

Q146. Is it possible to make any reliable measure of the illumination of the light source with the human eye unaided by anything? A. Totally unreliable.

Q147. Does the rotation of a flare in a test for wind velocity at the rate of four rotations per minute shed any light on the operation of that structure in a wind? A. It would shed some light,

286 but you are introducing a variable that never exists in practice.

The Court: It would depend on the strength of the wind.

The Witness: But you introduce a variable that you never have in practice, because in rotating that an air port and then an opaque section between air ports are alternately following each other around and the flare is constantly, the flame is constantly being pushed from one side to the other side, and it is a kind of operation that is just never found in
287 nature, so in research we would not do that, that is introducing a variable that might just as well be kept constant. You can direct the air stream, or rather project the air port toward an air stream, the axis of the air stream, and when you do that with all torches, then you have the same effect on one as with the other. But by rotating you are introducing something that is just non-existent in practice. It is another variable that takes place with these flames shooting in and out of the different ports.

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Cross Examination by Mr. Darby:

XQ148. Dr. Luckiesh, if I gave you as a scientist Plaintiff's Exhibit 19 and Plaintiff's Exhibit 10, and asked you to ascertain for me how much kerosene was consumed by each of them, both of them, over the same period of time under the same conditions, would you be able to do it? A. Yes.

XQ149. And from the viewpoint of fuel economy you would be able to compare one with the other? A. Yes.

XQ150. Strictly speaking, in the terminology of illumination, you would not call that a comparison of efficiency between the two devices, would you? A. I would not use the term in that way. 289

XQ151. You would not use the term in that way. However, if I was the one who conducted that comparison and told you that one or the other of them was more efficient from the viewpoint of fuel consumption, would you understand what I meant? A. I wouldn't be certain.

XQ152. You wouldn't be certain, you would have an idea? A. I think I would know what you were driving at, but you would have no concrete understanding, in my mind. 290

XQ153. It certainly wouldn't be scientifically accurate, would it? A. No.

XQ154. I think you made the statement, Doctor, that in your opinion the Withrow structure presented nothing over the prior very ancient art; did I correctly understand you? A. Nothing in principle over the Argand description.

XQ155. I don't believe you limited it to Argand—did you mean to limit it to the Argand description, or did you intend to include everything in the prior art? A. It would include—I would state it this way: Every principle involved there is found in the prior art. 291

XQ156. You did not mean that the structure was found in the prior art, did you? A. Principle, certain aspects of the structure, yes.

XQ157. Did you mean that that exact structure was found anywhere in the prior art? A. By "exact" do you mean exact configuration?

XQ158. No, I mean that exact combination. A. I hesitate to interpret the word "exact." I would

292 say that the principles involved there are found in Argand.

XQ159. And preparing yourself to give the answer you did on direct examination, you, of course, made yourself familiar with each of the patents of the prior art that are here before the Court, by the Defendant? A. Yes.

XQ160. You did? A. Yes.

XQ161. Of course, you studied the combination of elements which constitute the claims of the patent in suit, as part of your study, did you not? A. To the best of my ability.

293 XQ162. Will you agree with me, Doctor, that there isn't a single instance of the prior patented or published art which shows the combination recited in any one of the four claims in suit? A. I would say, if you want to talk principle in combination with—

XQ163. Just confine yourself to my question, please, Doctor. A. What is the question?

(Question repeated by the reporter.)

A. I will have to refer to the claims.

XQ164. Will you do so, please? A. Those claims are 2, 5, 11 and 12?

294 XQ165. That is right, sir. A. I would say that I do not believe I agree with you on Claim 2.

XQ166. All right. Let's take that first, then. First, you better finish your answer. You do not agree with me as to Claim 2. Do you agree with it as to Claim 5? A. I would not agree with you on Claim 5.

XQ167. Do you agree with me as to Claim 11? A. I think I would agree with you on Claim 11.

XQ168. And do you agree with me as to Claim 12? A. No.

XQ169. You agree with me as to Claim 11, but

not as to Claims 2, 5 and 12. Is that right? A. 295
That is right.

XQ170. Well, take Claim 2. What patent of the prior art shows that combination of elements? A. Do you mean, did your question involve patents?

XQ171. What patent or printed publication discloses the combination of Claim 2, in your opinion? A. My opinion is that a number of those—

XQ172. Just give me one, please. A. I cannot point them out from here. They are in the records. Let us say the Malcov, the Russian patent.

XQ173. The Russian patent? A. Yes.

XQ174. All right. Now, will you turn to this 296
Malcov patent? Will you point out where in the Malcov patent there is the torch body? A. I would call it below.

XQ175. In the lower figure? A. Yes.

XQ176. And that pear shaped structure is the torch body? A. I should think so.

The Court: That is on that photostat of the drawing of the patent for the year 1868?

Mr. Wisner: That is right, Your Honor.

XQ177. What is the opening for the wick? A. The opening for the wick?

XQ178. Yes, in the Russian structure. A. Just 297
above "C" apparently.

XQ179. And the wick extends up through that opening, does it? A. It does when it is burning. It would have to in order to burn.

XQ180. That is your understanding of the disclosure of the patent? A. Yes.

XQ181. And what is the flame guard for the wick mounted on the outside of the torch body? A. That is the whole housing with some holes in it, lateral holes.

298 XQ182. What is the cap? A. The cap would be this part of it.

XQ183. And is that cap provided with an imperforate top wall or a perforated top wall, as recited by the claim, in the Russian patent? A. Will you define "imperforate?"

XQ184. Has the cap of the Russian structure perforations in it? A. Yes.

XQ185. Then it is not an imperforate cap, is it? A. To all practical purposes.

XQ186. I say then it is not an imperforate cap, is it? A. Not in your sense.

299 The Court: Well, in what sense?

The Witness: In the practical sense that rain will not come through and put out the flame.

XQ187. The practical sense of what? A. The surface is curved.

XQ188. Does the Russian patent make any reference to that? A. I don't know. We have just a translation. I am not familiar with it.

XQ139. Have you read the translation? A. Yes.

XQ190. Is there anything in the translations to 300 support your statement? A. It does not go into great detail.

XQ191. As a matter of fact, the translation is very incomplete, isn't it? A. Very.

XQ192. And it is very ambiguous, is it not? A. Well, anything incomplete that tries to cover territory is ambiguous, as a rule.

XQ193. And you understand, don't you, that this is a translation of the specifications of the patent? A. Yes.

XQ194. Is there any other patent or publication of the prior art—well, I withdraw that for a min-

ute. As a matter of fact, doesn't this Russian 301
patent describe packing the top of the wick tube with charcoal? A. Charcoal or some other material.

XQ195. The wick itself does not extend up through it at all? A. It is packed around there, that is the best I could say.

The Court: Where is there any charcoal?

The Witness: You put asbestos or some other non-combustible material packed around there.

The Court: What would be the purpose of that? 302

The Witness: To make more of a protection from the wind.

Mr. Darby: Of course, we contend that that model is not made in accordance with the patent, Your Honor.

The Court: I understand.

XQ196. Does the Russian patent recite that this device is to be used as a torch or flare? A. I don't believe it does.

XQ197. What other patent of the prior art, in your opinion incorporates the combination of elements recited in Claim 2? A. I don't know of 303
any patent that would.

XQ198. Or any publication in evidence for the defendant in this case that recites the elements of Claim 2? A. How about the old Lighthouse? Suppose they put a wick in it and burned the wick in oil.

XQ199. For your information, Doctor, we are not engaging in suppositions. My question is confined to disclosure. A. I would not want to be bound by that.

XQ200. Will you agree with me that there is no

304 other patent or publication in the prior art that discloses the combination of elements of Claim 2? A. I cannot agree with you, because I am not sure that I know of all—I know of none.

XQ201. I think you said in your opinion Claim 5, you would not agree with me that there is no patent or publication of the prior art in this case that recited elements of Claim 5? A. That is right.

XQ202. Now, what patent or publication of the prior art did you refer to? A. As I read that hurriedly, it seemed to me that it did not differ from
305 Claim 2 enough so I would include it with 2, and I would use the same illustration that we gave, Malcov.

XQ203. The Russian patent? A. Yes. I may have missed a phrase or two, but it seems to me to be about the same. I would cover it exactly the same way.

XQ204. Now, having in mind, as you pointed out to me a minute ago that the wick in the Russian patent does not extend up through the top, point out to me in the Russian patent where there is means to hold the wick in place. A. As I recall
306 it, there is a tube within a tube, there is a tube that slips out over the tube that holds the wick.

XQ205. In the Russian patent? A. Yes, or the other way.

XQ206. Well, see if I understand what you mean. In the drawing, Defendant's Exhibit B, which purports to represent it—you mean there is a tube inside the tube A of that drawing? A. Inside the tube A—yes, that is my recollection. That is the best we could get out of our combined ideas of what the patent meant.

XQ207. There is quite a little dispute between

you as to what the Russian patent did mean? A. 307
As we said before, it is rather an incomplete sort of a statement.

XQ208. You had to do a lot of arguing back and forth and a lot of conjecture? A. Well, we had to discuss it.

XQ209. I presume all of you had different ideas about it? A. I don't think so, eventually.

XQ210. Eventually, although you had different ideas to start with, eventually you did come to an agreement? A. As a matter of fact, as I looked it over, I quite agreed with two others, my first view of it, and they had been studying it. 308

The Court: You mean they agreed with you?

The Witness: No, I found my diagnosis of it checked with what they had concluded, but it is a very difficult thing because it did not describe in words.

The Court: Did you change your opinion?

The Witness: No.

The Court: They came around to your opinion?

The Witness: No. They had the same opinion independently. They asked me what I 309
thought this was and what that was, and my recollection is I happened to agree with them.

XQ211. As a matter of fact, it was at best a guess? A. It was an intelligent guess, yes.

XQ212. I would not expect an unintelligent guess from you, Doctor. Now, the structure shown in Defendant's Exhibit B, the Russian structure, as I understand you, your interpretation of the disclosure is that there is a tube within a tube? A. Yes, that is our idea there.

XQ213. So that that inner tube is not shown in

310 that drawing? A. Either the inner or the outer, but it must be the inner, because of this (indicating).

XQ214. So that the means referred to in the claim of the patent, means to hold the wick in place, is the tube itself? A. The inner tube.

XQ215. Now, Claim 5 of the patent also calls for an imperforate top wall. And I think you agree with me that the Russian patent shows a perforate top wall, but Claim 5 also includes side flame openings? A. That is the one I was going to agree with you on. Is that in 5?

311 XQ216. Yes, side flame openings. A. I missed that one.

XQ217. Then you will agree with me that there is no patent or printed publication of the prior art which shows a combination of Claim 5? A. The exact combination?

XQ218. Yes. A. No.

XQ219. And I think the other claim was Claim 12, that you would not agree with me as not disclosed in the prior art? A. The one with the side openings, those, of course, I know of none. Never used side openings—that word steered me away

312 from that right away. Reading it hurriedly I missed it in No. 5.

XQ220. Didn't you also miss it in Claim 12, Doctor? A. Yes, I did.

XQ221. Then will you now agree with me, Doctor, that there is no printed patent or printed publication in evidence in this case that discloses the combination of elements exactly as recited in Claims 2, 5, 11 and 12 of the patent in suit? A. I would say that none discloses the exact combination.

XQ222. It is a fact, is it not, Dr. Luckiesh, that

in none of the prior art patents or publications in this case is there disclosed the exact combination of elements recited in Claims 2, 5, 11 and 12, or equivalent elements for any one or more of them, where they each perform the same purpose as each of the elements? A. I don't know what you mean by the last half—equivalent elements. I agree on the first half. 313

XQ223. You said side flame openings was an element that you did not think existed in the prior art? A. I mean in combination.

XQ224. Therefore, there was nothing equivalent to flame openings that existed in the prior art in that combination? A. Not in combination where the wick is definitely used, specified and agreed and described. 314

XQ225. Now, you referred to this Rutz patent, as to the structure which has been put in evidence—

Mr. Wisner: I offer the structure of the Rutz patent in evidence.

(The same was received in evidence and marked Defendant's Exhibit L.)

XQ226. As I was saying, you referred to the Rutz patent which is now marked Defendant's Exhibit L, the structure, and I think you stated that you saw this device, Exhibit L, in operation? A. Yes. 315

XQ227. And you tried to blow it out and, if I correctly understood your answer, you said that you were surprised that you could not? A. That is right.

XQ228. Well, why were you surprised? You expected to be able to blow it out? A. I had never seen that much, experience in flames that I could not blow out.

316 XQ229. I understand that you used to play the trombone, Doctor? A. That is right.

XQ230. And you have what is generally referred to as good wind? A. Some.

XQ231. So you had no experience with flames of this general character, that you could not blow out? A. In general, I could generally blow a flame out.

XQ232. And you were quite surprised to find you could not blow it out in this case? A. Rather astonished.

XQ233. And what would you say was the veloc-
317 ity of your breath when you blew at it? A. I have never measured it, but I can tell you it is far above the average that we find outdoors.

XQ234. And you think it is rather several miles an hour? A. Oh, yes, I think that is possible.

XQ235. Had you ever tried to blow out the plaintiff's structure or the defendant's structure, prior to the time that you tried to blow out Defendant's Exhibit L? A. I don't believe I ever did.

XQ236. You, of course, had seen the plaintiff's and defendant's structure before you saw Defend-
318 ant's Exhibit L, had you not? A. Oh, yes.

XQ237. And you had been told what they had been designed for and used for? A. Yes.

XQ238. Were you told that they had to pass certain state tests? A. State tests and regulations.

XQ239. And were you told that ran as high as 40 miles an hour? A. Yes.

XQ240. Did that surprise you? A. I could not see the sense in it.

XQ241. Well, did that surprise you? A. Nothing surprises me of that sort.

XQ242. You accepted that, as a matter of fact? 319
A. Yes.

XQ243. And yet, although you were not surprised that the defendant's and plaintiff's structures were required to withstand a wind velocity of 40 miles an hour, you were surprised when you could not blow out Defendant's Exhibit L with your breath? A. I could not take a strong pencil of air from my lips and blow it into the hole.

XQ244. Your surprise was occasioned by the particular structure of this patent? A. I was surprised how effective it was.

XQ245. And was your surprise occasioned by 320
the particular construction of this cap? I gather from your last answer that you had to contract your breath in a pencil of air— A. My surprise was due to the fact that I did not stop to analyze it before I tried to blow it out.

XQ246. As a matter of fact, this cap of the Rutz patent is for a gas burner on a stove? A. Yes.

XQ247. I think you stated on direct examination that you had caps like this on your stove, or very similar to it? A. Yes.

XQ248. And it never occurred to you, with your familiarity with those caps for years, that a thing 321
like that could withstand the wind that it did? A. I never tried it in a wind. I know it always stood up on our gas range. I never associated it with wind.

XQ249. One of the features of this Rutz patent —have you the structure there or the figure on Defendant's Exhibit B? A. Yes, sir.

XQ250. One of the features is it is provided with a number of air ports in the bottom flange, is that right? A. Yes, there are six or seven.

XQ251. And as revealed by the patent itself,

322 particularly in Fig. 2, those holes extend all the way around, is that right? A. That is my recollection. They show there. (Indicating.)

XQ252. So that there is virtually a cylinder of air that completely surrounds that gas burner; is that correct? A. Yes.

XQ253. The gas burner is heated all the time? A. Yes.

XQ254. And while the gas burner is heated air is rising through those holes and going upward, is that right? A. Yes.

XQ255. So that at all times there is virtually an
323 insulating—never mind the insulating—there is virtually a cylinder of air surrounding the burner and between the burner and the metal shield? A. A slowly moving cylinder, yes.

XQ256. It is a slowly moving cylinder? A. Yes.

XQ257. Now, how much of a wind would you think would be necessary to disintegrate that slowly moving cylinder and blow out that pilot light? A. It depends what chance the wind has at it, where the wind could hit it. Here is a skirt down here. (Indicating.)

XQ258. Let us assume that it comes right in
324 through one of the holes. How much of a gust of wind would be necessary to blow out that light? It would not be a very strong wind, would it? A. Oh, yes. The air does not like to go through small holes and around corners, particularly when you push on it hard.

XQ259. How strong a wind would that slowly moving cylinder of air rebuff so as to prevent it from blowing out the pilot burner? A. I do not see where that has anything to do with it. Wind is merely a transfer of momentum from one infinitely

small amount of air to another, and then the whole mass moves. 325

XQ260. On a gas stove you want to avoid your pilot light from going out? A. Yes.

XQ261. It is dangerous? A. Yes.

XQ262. You are burning gas there? A. Yes.

XQ263. And that gas is under pressure? A. Very low pressure, of course.

XQ264. But sufficient to cause it to flow? A. Yes.

XQ265. And that has to be maintained at the necessary pressure? A. Very definitely.

XQ266. Otherwise the pilot light is apt to go out and then you have escaping gas, is that right? A. Yes. 326

XQ267. And you want to protect that pilot flame from being blown out by currents of air, you certainly want to do that, don't you? A. Yes.

XQ268. And this slowly moving air cylinder would not protect the flame from a very strong current of air, regardless of how it got in, would it? A. I think it is a matter of definition of strong wind, of course. That wind maintained itself, of course; that flame is easier to blow out than a large kerosene flame, of course. 327

XQ269. So I understand therefore that you must protect that flame from say a gust of air, such as by closing a door suddenly? A. That is right.

XQ270. In a gas device of that kind? A. Yes.

XQ271. And that is pointed out in this Rutz patent in this language, and I read from page 2, beginning at line 96, as follows:

"In order to insure more perfect combustion I provide the hood dome with a series of auxiliary vents, 13, that encircle said dome above the firing ports, and hence air to supply oxygen to the flame

328 will be more readily drawn up through the bottom of the hood and caused to pass in vertical stratas," and this is the part that I desire to call particularly to your attention, "and caused to pass in vertical stratas about the pilot light and from thence through the firing ports and vents to effectually check cross currents of air while the small pilot light is burning."

The patentee points out just what you and I have agreed on. A. I would not say so. I would say quite the opposite. I think a lot of the statements are verbiage and sometimes meaningless. I think
329 that that statement is largely words.

The Court: What do you think of it?

The Witness: I think this is greatly shielded from gusts.

XQ272. Just from gusts? A. Things of that sort.

XQ273. But from the language that I read to you about this vertical strata of air around the pilot to effectually check cross currents of air while the small pilot light is burning, don't you agree that the patent specification points out that by that small column of slowly moving air, as you have
330 characterized it, he expects to check all the wind that that device is subjected to in normal domestic use? A. I would say that that movement of that upper column of air outwards is secondary, that is, it has a secondary protecting influence.

XQ274. Will you confine yourself to the language of the patent? A. I do not support that language; I do not hold any brief for that language.

XQ275. Isn't that what the language means to you? A. That that column is a protector against these drafts?

XQ276. Yes. A. Yes, and I would agree that it 331
is in a minor way, but not in the implied way.

XQ277. You understand, don't you, that the Rutz patent points out that the cap at the very top—would you point to the cap at the top?—points out that that cap is not to be heated at all, in other words, that the pilot is so positioned that it does not heat that cap? A. Of course it is not so, because all you have to do is put your hand on it.

XQ278. Do you understand from the Rutz patent that that is what is described? A. I frankly paid no attention to those phases of the Rutz patent because to me they are meaningless. 332

XQ279. Well, the patent says this:

"It is also essential to perfect combustion that the torch head tip, 9', which burns a constant pilot flame, should be spaced at a distance equal in all directions from the walls and dome of the hood to prevent generation of foul gases through the heating of said hood." Does that mean to you that you should avoid heating the hood? A. I never gave any thought to what it means to me because I think it is just drapery.

XQ280. Does that mean to you that the hood should be heated? A. I don't know why it has to 333
mean anything to me.

XQ281. You are not here at my invitation. I am asking you a question. A. I could very well say that it does not mean anything to me, and I would be pretty close to the truth.

XQ282. Since it would not be the entire truth, let me have the benefit of your opinion. A. Will you read it again, please?

(Question repeated by the reporter.)

A. It means nothing to me because I know of no knowledge that indicates to me that that is true.

334 XQ283. My last question is does that mean to you that the hood is not to be heated?

The Court: That is, was that the intention of the patentee?

The Witness: I do not know why it should mean that the hood should not be heated.

The Court: I do not think Mr. Darby's question is whether you agree with that statement but whether that language of the patent means that that is not to be heated.

The Witness: I don't see that it does.

XQ284. Now, I understood you to say, Doctor, 335 maybe I was in error, that in the defendant's structure there is provided no flange for conducting heat from the hood or the cap to the wick tube, is that correct? Did you so testify? A. None specifically designed for that purpose.

XQ285. You understand the function of the flange in the Withrow patent structure? A. I understand what the patent specification implies or attempts to imply. It will receive heat and therefore—

XQ286. It is heat by conduction? A. It would have to be heat by conduction from there in.

336 XQ287. So its purpose is to conduct heat from the heated guard down to the wick tube of the torch? A. Yes, which is unavoidable by any device which is around a wick tube.

XQ288. Now, that function is served in the defendant's structure by means of the metallic part No. 4, is it not? A. It is a result of that structure.

XQ289. In other words, this metallic part 4, through which the holes 6 are cut conducts heat from the heated hood to the wick tube, is that correct? A. Yes, just as all kerosene lamp structures do.

XQ290. And I am referring, of course, to the member marked 4 on Fig. 2, showing the Anthes structure of Defendant's Exhibit B. I am taking that precaution because in our exhibit, Plaintiff's Exhibit 25, they have different reference numerals. A. Yes. 337

Mr. Darby: That is all.

Redirect Examination by Mr. Wisner:

RDQ291. Did I understand you to say on cross examination, Doctor, when you were asked some questions with reference to whether there was any disclosure in the prior art of side flame openings, did I understand you to say the word "flame openings" or "air ports"? A. I think we meant air ports. 338

RDQ292. That is, you referred to the air port 7? A. Oh, yes, air ports.

RDQ293. Do you wish to correct your testimony in that regard? A. That is what we were talking about, I meant air ports.

RDQ294. That is not what you said, but that is what you had in mind? A. I meant air ports—not in exact combination with the others. 339

RDQ295. For example, you find side flame openings in the Malcov patent, don't you? A. Yes.

RDQ296. Those flame openings serve for the admission of air? A. Yes.

RDQ297. And that is on the side? A. Yes.

RDQ298. In the operation of Malcov which you observed, what effects did you perceive in reference to openings in the top of the dome? A. I could see no water drop through them.

RDQ299. With reference to soot, what did you observe? A. They sooted up immediately.

340 RDQ300. So in operation the device quickly came to have an imperforate top? A. Yes.

RDQ301. Now I show you Defendant's Exhibit I, the same being a model of Malcov which I have separated into its two constituent parts. When you said Mal had a wick within two tubes, it was as designed there? (Indicating.) A. That is what we have.

RDQ302. One tube contains the wick? A. And the other tube slips out down over it. I said that the tube containing the wick is on the inside of this structure.

341 RDQ303. The view on Fig. 4 of Exhibit B, is that a side elevation view? A. Part of a side elevation view.

RDQ304. It does not purport to show the two wick tubes? A. No.

RDQ305. I now hand you a copy of British patent to Salsbury, No. 16,524, of 1895. Where do you find air inlets in that particular structure? A. On the sides and the bottom.

RDQ306. In two places? A. Yes.

RDQ307. What was the purpose of that structure? A. To protect the flame from air currents.

342 RDQ308. Where was it used? A. My recollection is it was used indoors.

RDQ309. That is, outside on a carriage, or indoors, or where? A. More or less in closed places, I would call them.

RDQ310. Will you refer to the patent specification and refresh your recollection as to the use described therein? A. Shall I read it?

RDQ311. Just refresh your recollection as to what use it was put to. A. I received the impression it was used indoors because one of the claimed virtues is it burns steadily and is free from smoke.

RDQ312. It refers, however, to carriages, does it not? A. That is, the inside of carriages? I do not know; I do not see. 343

RDQ313. How would it operate outside? A. It operated very well in the several mile wind when I saw it operating.

RDQ314. Is there any lack of disclosure of imperforate domes or imperforate tops for flares in the prior art? A. No, there are a great number of them.

RDQ315. I hand you Plaintiff's Exhibit 9 and direct your attention to the drawing in the lower left-hand corner of that exhibit and ask you what you find superimposed above the wick? A. A flat umbrella. 344

RDQ316. I will ask you to look at the date of that drawing. A. The date on the blueprint is March 24, 1926.

RDQ317. That could be used, could it not, to protect a torch from rain? A. Yes.

The Court: You say that there is nothing in the prior art patents or prior publications reading exactly on claims 2, 5, 11 and 12?

The Witness: As I recall the question, it described the exact combination. 345

The Court: That is what I say, reading exactly on claims 2, 5, 11 and 12?

The Witness: Nothing that I know of, the exact combination.

RDQ318. That is, with the flame ports and air ports, both, at the side—

Mr. Darby: No, no,—

Mr. Wisner: That is what the witness is talking about.

The Court: Let me have what you have to say about that.

346 The Witness: My recollection is it was one of the earlier claims, and the only point is this, was the fact that it was perforate instead of imperforate with small holes there. I agreed with Mr. Darby on that, and we came to another claim, and I said I will agree, I know of nothing in the prior publications that had side air ports. I understand that I said flame ports, but I meant air ports, and that is agreed, which shows the exact combination. I emphasize "exact combination." I almost have to answer it that way.

347 The Court: I understood you to say there was nothing which showed the exact combination.

The Witness: Not that I know of, the exact combination. It was the side air ports that made me agree with you on that.

The Court: Are you seeking to draw a distinction there? I want to get it clear in my own mind.

The Witness: Well, of course, that covers territory up to then I do not believe was covered—

348 The Court: I do not want to go into detail, I just want to get this clear in my mind.

The Witness: All kerosene devices, what we call kerosene lamps, have their holes down here, that is universal. But there have been all kinds of devices made. I do not say they have been patented, I am not familiar with patents very well. I have seen devices that had this combination, the holes in there (indicating).

RDQ319. You are referring now to Fig. 2? A. Fig. 2. When you have the holes in the bottom, and as the lawyer stated, I thoroughly agreed with

Mr. Darby on the exact combination, and the point was because I was looking out for that word, side air ports,— 349

RDQ320. That is, referring to Fig. 1? A. Yes, as used in the Withrow device. That was my contention.

Mr. Darby: All I have to do, Your Honor, is to take the witness over element by element and claim by claim and then force him to admit, as he will be forced to admit, that there is nothing in the prior art that shows the combination of any of those claims, and that is what I propose to do. I haven't any doubt about that. 350

The Witness: I think that is in the record.

The Court: What?

The Witness: That I agreed with Mr. Darby that in my opinion that perforate, that that claim is not wholly and exactly represented by Malcov, and then I agreed on the others.

The Court: Is there anything in the prior art showing this combination of elements?

The Witness: Not the exact combination; they may have side air ports. 351

Mr. Darby: Now you limit your answer to side air ports—

The Court: I do not know whether it is your turn now.

Mr. Wisner: I am perfectly willing to have Mr. Darby go on.

The Court: I would like to have you finish first.

Mr. Darby: I will co[illegible]r it, because three of of the claims do not mention side air ports at all.

352 The Witness: That is the one I was watching, for, in 5, no, not 5, 11, lateral exit of flame and entrance of air, which means the addition of air ports and flame ports. I thought I made it quite clear.

The Court: Were you contrasting "exact" with something else here?

The Witness: No, I am trying to use the term "exact combination" to be that it is exact with it.

The Court: Do you mean there is anything near it?

353 The Witness: Yes, I think there are things near it.

The Court: How far away are they? Let us see.

The Witness: I do not know as I could cite anything out of the great mass of what I have had here. As I have stated several times, I am not very familiar with patents; I am familiar with what is in the literature, the scientific literature, as a rule. But I thought I rather agreed with Mr. Darby that this is not an exact combination of those things because

354 of the pin holes—

The Court: You are referring to Malcov now?

The Witness: Malcov. I agreed that 11 and 12 wasn't there. I agreed with Mr. Darby on that. I know of nothing that has that exact combination in the prior art. It all depends on the definition of "exact."

The Court: What do you mean by that? Let us have your meaning of that.

The Witness: Well, "exact" would mean you would have your air coming in a different

orifice than your flame going out, that would 355
be "exact."

Now, if you cut this out the air ports and the flame ports are the same. I do not know whether that would be exact, that is the thing to argue about; I wouldn't particularly argue about it. A flame port down here, the air could come in here like it does in Malcov, and the flame could come out here. That would be the natural flow of air, heated air.

Mr. Wisner: May it please the court, before we go on with further cross examination of the witness, I have a motion to make con- 356
cerning a matter which only came to my attention at the close of the hearing yesterday. I refer to Plaintiff's Exhibits 18 and 25. Next to the last line it states here: "Side flame openings 9." The word "openings" is not in the claim of the patent and I move that from each of the exhibits it be stricken, or the exhibits themselves be stricken.

Mr. Darby: Your Honor, these exhibits are for the court's convenience, reciting the elements of the claim and showing how they are applied to the structure of the patent, as well 357
as the structure of the defendant.

The Court: I understand they are merely there for illustrative purposes.

Mr. Wisner: They are slightly more than that, Your Honor.

The Court: I suppose it is like a brief.

Mr. Wisner: I considered it was an exhibit.

The Court: Mr. Darby, you might state, so that the record will indicate, the purpose of the exhibit and to what extent it would be binding.

358 Mr. Darby: If my previous statement does not do so, Your Honor.

The Court: I thought it did but—

Mr. Wisner: Is the statement then that what are labeled claims in this exhibit do not necessarily read like the claims?

Mr. Darby: They are in interpretation of of the claims, pure and simple, with such added words as necessary to make the application of the claim perfectly clear, from the plaintiff's viewpoint.

Mr. Wisner: I simply wanted that particu-
359 lar point clear.

The Court: Now is there any other place besides the word "openings"?

Mr. Wisner: In claim 12, the third line from the bottom, the words "provision for" are not in the claim.

Mr. Darby: In each instance where we thought it would help to make the explanation clear, if we interpreted words, we put it in parenthesis.

The Court: Yes, I notice that.

360 *Cross Examination by Mr. Darby*:

XQ321. You understand in the structure of the patent as illustrated, for example, in Fig. 1 of the Withrow patent as reproduced on Defendant's Exhibit B, that there are restricted openings for air, do you not? A. I do.

XQ322. What are those restricted openings? A. No. 10 below the flame port and in the sides. Of course, they are restricted particularly under the condition of zero wind.

XQ323. How do they restrict the admission of

air? A. Because the hole is an emptiness, not 361
formed of material.

XQ324. That is, the holes are relatively small, is that the idea? A. Yes.

XQ325. Now, referring to the Russian patent, Fig. 4, Malcov. Are there similar restricted air openings in the Russian patent? A. Not similar restricted air openings.

XQ326. Are there any restricted air openings in the Russian patent? A. The very presence of this metal means that there is some restriction.

XQ327. Then the restriction is the restriction effected by the size of the flame opening itself? A. 362
Well, I do not say that; I would say by the size of the metal parts rather than the openings, that would govern the restriction.

XQ328. And the limit of the restriction is the peripheral edges of the metal parts which define the flame openings? A. Yes, I would say that. To put it in just ordinary language, the restriction is roughly in proportion to the amount of metal that is present in the circumference.

XQ329. How long have you been with the General Electric Company, Doctor? A. Twenty-
seven years. 363

XQ330. How many? A. Twenty-seven.

The Court: Do you regard Malcov as the best reference here?

The Witness: Of all that there are, it is the best one to analyze all these parts in combination.

XQ331. And you say throughout those entire twenty-seven years you have been with the General Electric Company? A. Yes.

XQ332. Devoting your entire time to their work? A. Correct.

364 XQ333. And throughout those twenty-seven years has the General Electric Company produced commercially or experimentally, to your knowledge, kerosene burners? A. No, but we have been in competition with them, very decidedly originally, so we had to do a lot of work on them.

XQ334. Have you personally done a lot of work on kerosene burners? A. Oh, yes.

The Court: Then it is your position that anyone skilled in the art, having Malcov, could have produced this?

The Witness: Knowing Malcov?

365 The Court: Yes.

The Witness: And in the light of the knowledge that was acquired seventy years later, or whatever the time was, it would have been a good beginning, very good beginning.

The Court: That, of course, does not answer my question.

The Witness: Where we begin we improve.

The Court: I know sometimes we refer to hindsight and foresight, and so on, but what I want to know is, you claim Malcov is your best reference, that is one thing.

366 The Witness: It is the best reference in structure, but not in principle.

The Court: What I want to know is, in your opinion could anyone skilled in the art, having Malcov in mind, have produced this device described in the plaintiff's patent?

The Witness: It would be fair to assume that he has other contiguous and contemporary knowledge, such as the Argand, involving certain principles. If he had that knowledge plus this—

The Court: Plus which?

The Witness: Plus this structure avail- 367
able—

The Court: Now you are referring to Malcov?

The Witness: Yes, of Malcov, and knowledge of the principles that had been developed from the time of Argand, he would make a very, I think he ought to make a better one.

The Court: Than what?

The Witness: Than Withrow.

The Court: You have been in this line how many years, twenty-seven years?

The Witness: I have never been in the de- 368
sign of flares or anything of that sort.

The Court: Do you know anything about this, whether there has been any effort to improve these flares?

The Witness: The only effort that I know was the rather general typical cut and try method that has been used—

The Court: I may be going both beyond the direct and cross examination.

Mr. Darby: Mr. Wisner and I both welcome that, Your Honor.

The Witness: The only effort I know of is 369
the usual cut and try process. It seems simple, particularly when you start with a primitive light source, it seems hard to remember that there have been so many developments—

The Court: You realize that if there have been developments, that there should be some of it survive that would occur to one skilled in the art.

The Witness: But these things all did occur to others with light sources that they used indoors where they had to get rid of the soot

370 and smoke and nuisance—

The Court: Do you know why they did not use them outdoors before they actually did use them, on the road?

The Witness: The roads have become immensely more important in the last ten years, that is the real reason.

The Court: Of course, they have been used on roads for years, there have been improvements on roads for years before that.

The Witness: But they were not used in the quantities that they have been for the last
371 ten years.

The Court: You think that these have been used for about ten years, about ten years ago they started to use them?

The Witness: Oh, they used them before that, I carried one in a torchlight parade when I was a boy.

The Court: How long have they been using, not in a torch for parades, but instead of red lanterns on the road, how long have they been using them for that?

The Witness: I couldn't say as to that, sir,
372 I have seen them all my life.

The Court: What I am getting at is, with the knowledge of Malcov, why do you think that it wasn't possible that people could have used this and developed this before?

The Witness: Necessity is the mother of invention and development.

The Court: When do you think—

The Witness: These were good enough for casual uses.

The Court: When do you think this demand arose?

The Witness: I think it arose due to the 373
increase in traffic on the roads, the numbers of trucks and—

The Court: When?

The Witness: It is obvious from the sales that it began to pick up in the last ten years with the great trucking business on the highway and the tremendous amount of road building.

The Court: When was this plaintiff's product produced?

The Witness: I am not sure; about 1929, 374
was it not? I mean the improvement.

The Court: You think it was about the time that the demand arose?

The Witness: Yes.

The Court: Not before then?

The Witness: I think the demand, like all demands, had a normal growth, the curve started gradually, and then went up fast, with all the increased traffic and the necessity of signals on our highways, and the consciousness of safety and danger, and deaths, and all that. That caused the demand, and demand is the mother of invention. 375

Redirect Examination by Mr. Wisner:

RDQ335. Doctor, in your work have you had occasion to concern yourself with highway traffic and safety on highways? A. Oh, yes, from all angles.

RDQ336. Doctor, you were asked some questions by the court about taking Malcov as a precedent and producing the device of the patent in suit. Have you an opinion as to how well that could be

376 accomplished by taking Malcov in the light of Rutz, which is Fig. 3 in Defendant's Exhibit B? A. By lifting Rutz off of that little gasket and putting it on an appropriate kerosene torch, we will say, just as was done here—

RDQ337. Referring to Defendant's Exhibit L. A. Just as was done in Defendant's Exhibit L, providing a flare—

The Court: Is that a new combination of elements?

The Witness: That is taking the whole thing, that whole business, with the exception
377 of the wick and torch body—

RDQ338. Referring to the hood—

The Court: You mean if you take—

The Witness: Take this housing—

The Court: Take Rutz and Malcov together?

The Witness: No, this one alone.

The Court: Alone?

The Witness: Take that off of the gasket.

The Court: Yes.

The Witness: And take a torch, an open torch, with a hole of the right size, and this
378 enclosure that is called for in the Rutz patent, Fig. 3 in Exhibit B, replace this whole thing in a Withrow device. Now, the surrounding flame, wick, burning flame, and you have a flare. The difference now is—

The Court: How would you apply that Rutz to Malcov?

The Witness: I wasn't asked that question.

The Court: You said you would apply the Rutz, you could apply Rutz to what?

The Witness: Malcov is another device entirely.

The Court: I understand Rutz was a gas 379
stove.

The Witness: Yes, and you lift it from one purpose to another. If I understand the question correctly, it applied entirely to Rutz.

RDQ339. In transferring the Rutz hood to a torch body do you make any change in its function or operation? A. All the principles of operation remain the same.

Recross Examination by Mr. Darby:

RXQ340. Do you mean just that? There is a 380
difference in the function, is there not? A. The principles remain the same.

RXQ341. The function is different, isn't it? A. Oh, yes, sir.

RXQ342. And its operation is different, isn't it? A. I wouldn't say the operation is different.

RXQ343. When it is on a gas stove is it a flare? A. Oh, no.

RXQ344. Is it a light source at all? A. It is, but not an intense light—

RXQ345. You do not see it, do you? A. Oh, yes, I see it. 381

RXQ346. You have to get down and look through those holes to see it. The idea was not to use it as a light, was it? A. No.

RXQ347. So its operation is different as a flare than on a gas pilot? A. I do not say its operation is different. By "operation" I mean how does it operate in here. If you mean its intention, its final purpose, I agree with you sufficiently.

RXQ348. Well, it does not operate to give a flame that is visible from at least 500 feet, does it? A. I quite agree with you.

382 *Redirect Examination by Mr. Wisner:*

RDQ349. But when it is placed down in a torch body, it does operate then to give a flame which is visible at 500 feet? A. That is right.

Mr. Wisner: That is all.

The Court: Do you think that would occur to anyone who was skilled in the art?

The Witness: If he knew this—

The Court: I am talking about someone skilled in the art.

The Witness: Yes; no question about it.

383 The Court: That means he had knowledge of these things?

The Witness: No question about it.

The Court: You think the reason that it wasn't done before is that there was no demand?

The Witness: The principle involved—

The Court: You think the reason it wasn't done before is that there was no demand?

The Witness: Necessity is the mother of invention, and that is what brought about this. Flares became more important, had to be

384 safer with increased speed on the highways, twenty-five million automobiles, and a lot of trucks killing twenty-five thousand people a year.

The Court: You think that only arose ten years ago?

The Witness: The curve growth was obviously the usual curve growth, where crudely it starts slowly and then goes up, and it has increased and resulted in an increase in the use of these flares in the last ten years.

The Court: You think that was only within the last ten years? 385

The Witness: I wouldn't be an expert on that. I would say generally about ten years ago there arose a definite consciousness of safety, and measures of safety had to be taken on the highways that we never had before in the old horse-and-buggy days.

Recross Examination by Mr. Darby:

RXQ350. Just one question more. As I understood your answer to the question, it is your opinion that a man skilled in the art who was seeking to produce a warning flare in a kerosene burner that would withstand gale velocities as high as 40 miles an hour, if he knew of this gas burner of Rutz, that would at once occur to him as being adaptable and usable for the purpose of producing that flare which would withstand gale velocities. Do you mean to testify to that? A. If he were consciously searching for something of the sort that you describe. 386

RXQ351. And he knew of this? A. And he knew of this. 387

RXQ352. Rutz? A. Rutz.

RXQ353. It is your testimony that that would occur to him automatically? A. Yes, if he was consciously searching for what you describe.

RXQ354. I want to be sure we are talking about the same thing. We are talking about the device which is marked Defendant's Exhibit L, is that right? A. That is right.

RXQ355. And that is the device that you were surprised to find you couldn't blow out with your breath, is that the same device we are talking about? A. Yes.

388 HENRY T. ATNO, called as a witness on behalf of the defendant, having been duly sworn, testified as follows:

Direct Examination by Mr. Wisner:

The Witness: I am at the present time manager of the Wick Division of the Standard Oil Company of New York. I was subpoenaed as a witness in this case. I have been with the Wicking Division about six years. We sell wicks for use in all forms of oil burning devices. Those wicks are manufac-
389 tured under an operating contract in the hands of William E. Hooper & Sons Company, Baltimore. I am reasonably familiar with the methods of manufacture of wicks. When yo refer to capillary lift, those words have a particular significance in dealing with wicks. We regard the phenomenon of capillary lift as the capacity of a substance to lift oil a certain distance against the force of gravity. As to the definite limits on that capillary lift, in our experience we have always tried to hold designers of lamps and other oil-burning devices to a five-inch lift.

390

Cross Examination by Mr. Darby:

The Witness: As to whether there are any definite limits, I would say that the limit would be governed by the height to which capillarity would become effective in combustion. I would say practically that would not be greater than seven inches at the most.

RAY F. HUTT, called as a witness in behalf of the 391
defendant, being first duly sworn, testified as follows:

Direct Examination by Mr. Wisner:

The Witness: I live at Fort Madison, Iowa, and am engaged in sales for Anthes Force Oiler Company. I first came in contact with the flare business in May, 1933. Since that time I have been familiar with various state tests. I have visited state testing laboratories and witnessed tests.

Q6. Now, on cross examination the witness Close 392
was asked question 100 as follows: "XQ100. Are any of the states more difficult to qualify a torch in than other states? A. Yes, these states that have a law similar to the one, for instance, in Pennsylvania, are more difficult to pass than other states because of the rigid requirements in the specifications, as noted in my testimony."

And also question 101: "XQ101. You characterized Nebraska as one of those states. A. Nebraska is one of those states, because it has practically the same law, the same specifications."

Do you agree with that testimony? A. The 393
specifications of Nebraska are not exactly the same as that of Pennsylvania, but they are both strict specifications. I agree in general.

The Witness: To my knowledge, Iowa was the first state to pass the statute for flares to pass tests. Most of the states now require twelve hours. The tendency is in that direction. I am quite sure that the original Iowa tests had no relation to the weather which is customarily found in Iowa.

Q10. Have you recently had occasion to submit

394 any flares to the State of Nebraska for tests? A. Yes, in October of 1937.

The Court: Perhaps you can state what you want to prove, and maybe it will be conceded. I do not know what the point is here.

Mr. Wisner: The point is this, may it please the court:

I offer in evidence as a defendant's exhibit a certificate from the State of Nebraska, qualifying a torch with a torch body disclosed on Defendant's Exhibit L, and with the Rutz structure superimposed thereon, for sale as a
395 flare in the State of Nebraska.

Mr. Wisner: We do not offer the tests as such. We offer first the certificate of qualification. All we seek to show by that document, Judge, is that this flare can be taken out in the State of Nebraska and sold for use on highways.

The Court: For that purpose only will the exhibit be received.

(The paper was received in evidence and marked Defendant's Exhibit M.)

Mr. Darby: Will you pardon my interrup-
396 tion? I would like to have it appear on the record that I believe to be the fact, that it is not the identical device which is here in evidence as Defendant's Exhibit L that was tested in Nebraska.

The Court: Not that identical one, but one similar to it.

Mr. Wisner: Similar in all respects, Your Honor.

The Witness: I was connected with the Anthes Company during the early part of 1934 and the last half of the year 1933, and during that period

we were manufacturing a flare of the type shown 397
in Plaintiff's Exhibit 2. That manufacture was discontinued and a different sort of a structure was subsequently manufactured and sold by our company. We had complaints from several sources, and it was my observation that the body of the container became quite hot and was difficult to handle after it had been burning for some time. The thickness of the metal and the amount of fuel that it contained and the size, with that large flame, caused this condition, we reasoned, and the burner was raised above the body and mounted on the wick tube in order that air might circulate, and so that 398
it was farther away so that the body would not become so hot. There is some heat in the torch body now but they can always be handled.

Mr. Wisner: I offer in evidence as defendant's exhibits photographs of testing apparatus identified by Professor Croft on a deposition taken out at Iowa City, Iowa, and offered during the taking of that deposition.

(The photographs were received in evidence and marked Defendant's Exhibits N, O and P.)

Mr. Wisner: Now, with reference to the 399
record in the preceding case, in the Circuit Court of Appeals, I have only one copy, which I borrowed from counsel in that case. That is the only complete copy which he had. Mr. Owen says that he received only two copies. I should like very much to offer this copy that I have, except it has been somewhat marked up by counsel.

Mr. Wisner: I offer it in evidence.

(The copy of record was received in evidence and marked Defendant's Exhibit Q.)

400 DEPOSITION OF HUBER O. CROFT EXAMINED ON BEHALF OF DEFENDANT AT IOWA CITY, IOWA, ON JANUARY 18, 1938.

HUBER O. CROFT, being duly sworn, testified as follows:

Direct Examination by Mr. Wisner:

The Witness: My name is Huber O. Croft, I reside at Iowa City, Iowa, and I am a mechanical
401 engineer, head of the Department of Mechanical Engineering of the University of Iowa. I have been so occupied since 1929. I was employed at the University of Illinois from 1921 until 1927, as instructor and assistant professor of mechanical engineering. And from 1927 to 1929 at Stanford University as associate professor of mechanical engineering. I got my B. S. degree from the University of Colorado; my M. S. degree from the University of Illinois. M. S. is a Master of Science. I have written various articles for engineering publications and have written seven or eight divisions of
402 books edited by my brother Terrell Croft, and wrote the divisions of Heat Transfer and Fluid Flow for the Gas Engineering Handbook published by the McGraw-Hill Company, and just completed a book on Thermodynamics, Heat Transmission and Fluid Flow which will be published by the McGraw-Hill Company probably in May, 1938. I am a member of the American Society of Mechanical Engineers; the Iowa Engineering Society; the Iowa City Engineers Club; the American Association for Advancement of Science, and a Society for Promotion of Engineering Education. I am a

registered engineer under the state laws of Iowa. 403
I have participated in the making of various tests of devices, since 1922, at the University of Illinois, where I assisted in the experimental tests conducted to determine the characteristics of the ventilation tubes for the Hudson River Tunnel. Since that time, I have continuously been doing experimental work of one type or another, running some boiler tests. Much of my experience has had to do with combustion.

I have made tests of devices in connection with this case. We have tested two types of flares, one made by the Toledo Pressed Steel Company, and 404
the other made by the Anthes Force Oiler Company. The flares of the Toledo Pressed Steel Company were purchased from the Sears Roebuck Company in Iowa City. The Anthes flares were obtained from the Harrison Wholesale Company in Chicago, and one which was marked with our No. 2 was obtained directly from the Anthes Company. I have seen the device marked Defendant's Exhibit "G." That is the Toledo Pressed Steel flare which we marked 8B. Our test number 8B, on which we performed a series of experiments. On the top of the flame guard I find stamped "Patent 405
No. 1,732,708." The brass tubing and a glass tube protruding from one side of the flare was not on it when I purchased it. This addition of the copper tubing and glass is to assist us in making tests on this flare at constant kerosene level in the base of the flare. Elmer C. Lundquist added this contraption to the flare. The stamping on the top of the base of the flare reads: "The Toledo Pressed Steel Company, Toledo, Ohio. Toledo Truck Flare."

I have seen the device marked Defendant's Ex-

406 hibit "H." This is the Anthes Flare which we purchased for testing purposes and which we marked for testing purposes, Flare Y. Protruding from one side of this flare is some brass tubing and a glass tube between the two. That was added by Elmer C. Lundquist for the same purpose as the tube I testified was added to Exhibit G. The top of Exhibit H, consisting of the burner dome and cap, has been tagged Defendant's Exhibit J. I direct your attention to the fact that the cup containing the burner cap appears to be split, the entire burner cap and two halves of the burner cup
407 are joined together. That particular fuel guard was in that condition and also the split receptacle was in that condition when I obtained it. With reference to the burner cup attached to contain the cap, that was in the split condition when obtained by me. That particular cup which I have called a receptacle was received by us from Mr. Anthes. The purpose of the split receptacle was to test an identical flare both with the receptacle and possibly the flame guard and without both the receptacle and the flame guard without disturbing the characteristics of the wick.

408 I have seen the device marked Defendant's Exhibit I. That is an Anthes flare which we tested and which for our test purposes we marked Flare Number 2. The copper tube which protrudes from one side of it performs the same function as the copper tube I previously testified about with reference to Exhibit G. These tests of Exhibits G, H and I were conducted in the Mechanical Engineering Laboratories of the University of Iowa. The tests were initiated on December 24, 1937, and they were completed on January 16, 1938. The tests were conducted under my supervision. I am ac-

quainted with Elmer C. Lundquist. Elmer Lund- 409
quist performed the tests, took the majority of the observations. He is in the Mechanical Engineering Department of the University of Iowa.

The objects of these tests were to determine the characteristics of the two types of flares in question. The tests were conducted indoors where still air conditions prevailed and all tests were conducted at night. The tests were conducted at night to prevent interference from outside light sources. Some tests were conducted under conditions of artificial wind. The flares to be tested under wind velocities were placed 20 feet from the end of a 24- 410
inch diameter duct which was 22 feet long, to which was connected a variable speed fan; to the intake of the fan was connected a 25 foot long intake pipe. In all tests reported, the four flame orifices of the flame guard were so located that two pointed directly up and down stream, and two were perpendicular to the direction of the wind flow. The velocity of wind was determined by a Boyle Velometer. The Boyle Velometer consists of an indicating instrument and an impact tube which was connected to the indicating instrument by means of a rubber hose. It is my opinion that the Boyle 411
Velometer is one of the most scientific instruments that can be used for low air velocities. I think it is generally conceded to be a most accurate instrument. The apparatus used for the measuring of the illumination of the flares was a Weston Illuminometer. This piece of equipment consisted of two parts, an indicating device calibrated in foot candles, and the light sensitive portion of the instrument which consisted of two circular, active photo-sensitive eyes each 1.65 inches in diameter, pitched 2.15 inches on centers, and which was con-

412 nected to the indicating instrument by suitable wiring. The photo-sensitive eyes of the Illuminometer were mounted in a rotating and supporting arm which was so constructed that it could be rotated about the axis of a flare in order that the illumination at different points around the circumference of the flare could be determined. In most of these tests the illumination readings were taken in a horizontal plane, that is, a line passing horizontally through the flame orifices of the flame guard passed midway between and perpendicular to the eyes of the photo-sensitive device. Readings
413 were taken at 8 points around the circumference of the flare. These points were spaced forty-five degrees apart.

The precautions taken to prevent interference between the arm containing the photo-sensitive cells and the stream of wind current were that the supporting arm for the photo-sensitive eyes was directly upstream from the flame guard. It never was on a line drawn between the aperture from which the wind was emitted and the flame guard of the flare. The minimum length of time of these tests was one hour. During a test six illumination
414 readings were taken at each of the 8 points around the circumference of the flare making a total of 48 separate and distinct readings of the illumination. During the test period of an hour, 48 readings were taken of wind velocity.

Measurements of fuel consumption were made. The amount of fuel consumed was determined by maintaining the kerosene level in the base of the flare constant for any particular test, and the volume of kerosene required to maintain the constant fuel level determined by employing a calibarted burette which, by means of a valve at the

bottom, could admit kerosene through the gage glass, the upper part of the gage glass tube, and which permitted the volume of kerosene used to be accurately determined. A burette is a long glass tube with a spigot at the bottom end and through which the flow of liquid may be controlled quite accurately. The burette is used with the axis of the glass tube in a vertical direction. In order to make any necessary correction for an excess or deficiency of fuel supplied during the test, the flare was weighed both before and after a test and the necessary correction for excess or fuel deficiency determined. I took into account the effect of the capillary lift in the wicks which I used. In order to discard the variable of capillary lift of the two types of flares, we ran most of the tests at the condition of identical distances from the fuel level to the top of the wick tube in both types of flares. When we refer to capillary lift, that simply means the distance between the fuel level and top of the wick tube. The reasons for maintaining a definite fuel level were to discard the possibility of a variable capillary lift in the tests. For all tests the original wick supplied with each flare was charred in order that errors due to splaying and raveling of the wick would not be introduced. The distance between the top of the wick tube and the top of the wick was maintained constant for all tests. In some of the tests this distance was varied in order to determine the effect of the height of the wick above the top of the wick tube. The wicks used in the tests were those supplied with the flares. We made measurements of the wicks. We found that in the Toledo 8B flare the wick diameter was 13/16 inch, and the wick tube diameter was 3/4 of an inch; and, in the Anthes Y flare, the wick diam-

418 eter was 21/32 of an inch and the wick tube diameter was 17/32 of an inch.

In some of the tests, the flame guard of the Anthes flare was simply removed by unscrewing and tests conducted with the flame guard removed. This left what we have been referring to as the burner cup or flame guard cup in position. During some of the tests this cup was removed. In the tests which compared the Anthes burner with the flame guard receptacle and without the flame guard receptacle, the split receptacle was used. The split receptacle consisted of the regular Anthes recep-
419 tacle which had been sawed in two halves, using a jeweler's saw, and which could be held in place around the wick tube by a circular wire spring. The flare could, therefore, be tested with the split receptacle in place and, by unsnapping the spring, the split receptacle could be removed without disturbing the condition of the wick. That is the device which has already been identified as Defendant's Exhibit J.

In making these tests we used a kerosene which was purchased from the University storehouse and which had a flash point of 155.1 degrees Fahren-
420 heit as tested in the Cleveland Open-Flame Tester. The specific gravity was 45 degrees, A. P. I., which gave a specific gravity of 0.805 at 78 degrees Fahrenheit.

The term "efficiency" as used in the description of these tests means the ratio of the illumination in foot candles at 12 inches; secondly: the weight of fuel used in pounds per hour. That is, if "I" represents the illumination in foot candles at 12 inches, and "W" represents the weight of kerosene used in pounds per hour; then the efficiency is I over W. In other words, the efficiency compares

what is put into the device in the form of fuel with 421
what is taken out of it in the form of light. The efficiency usually means the output divided by the input and, in this case, we are dividing the output in light by the input in kerosene.

In the first 16 tests the distance from the axis of the flare to the plane of the photo-sensitive eyes was 7½ inches; in tests 17 to 46 inclusive, the distance from the axis of the flare to the plane of the photo-sensitive eyes was 12 inches. The readings taken with the photo-cells 7½ inches from the axis to the flare was corrected to the 12-inch distance by using the "Inverse Square Law." It is a well 422
recognized law for correction but, of course, only applies to point sources of light. That means for those tests which were corrected by this method, error in absolute values has been introduced, but for comparative purposes, no error has been introtroduced.

The three photographs marked Defendant's Exhibits 34, 35 and 36 (N, O and P) illustrate the flares and equipment used by us for performing characteristic tests and to show both the Anthes and Toledo flares. In Defendant's Exhibit O, the circular table in the lower middle of the photo is a 423
supporting table upon which the flares were tested. Extending to the left of that table is an arm; upon the arm is an upright. The extending arm to the left of the table is the rotating and supporting arm for the photo-sensitive eyes of the Weston Illuminometer. The object protruding from the top of that arm is the photo-sensitive eyes. At the right, in Defendant's Exhibit O, there are two glass tubes, two horizontal tubes and two vertical, one above the other. The topmost tube is the bottom of the burette, showing the spigot valve. The

424 lower glass tube indicates the height of kerosene in the base of the flare and was used to maintain a constant kerosene level during the test. The flat table-like object in the foreground of Exhibit P is a flat sheet used to promote parallel flow, horizontal flow, over the flare, and to prevent any undesirable eddies to project themselves over the flare and its supporting table. At the front and upstream edge of this table is shown the impact tube of the Boyle Velometer, by means of which, velocity readings were taken.

We found that the average wind velocity at
425 which the Anthes flare without the flame guard was extinguished was 15.3 miles per hour. In determining that fact, the receptacle which holds the flame guard, as well as the flame guard, was not removed. The split base was on the flare. We made tests to determine at what wind velocity the Toledo Flare would be blown out, its flame guard being removed. We found the average wind velocity at which the Toledo flare, without the flame guard, was extinguished, was 11.3 miles per hour. We made tests to determine what was the greatest wind velocity for each of the two flares
426 with the flame guards in place, what they would withstand. We were unable with the equipment as installed to extinguish either of the two flares. This maximum wind velocity of 33 miles per hour was the maximum we could attain without extensive readjustment of our testing equipment.

Q116. Did you consider there was any object in testing the flares with the flame guards in place at velocities higher than they would be blown out with the flame guards removed? A. It is my opinion that greater wind velocities than this would be of

purely academic interest and, therefore, we did not go to higher velocities. 427

We made some tests having to do with the effect of wick height on performance. The three graphs marked Figs. 4, 5, and 6 were prepared by Elmer C. Lundquist, under my supervision and direction. These graphs were prepared from test data obtained by Elmer C. Lundquist. I have seen the stenographer's notebook marked Defendant's Exhibit 38. Most of the handwriting in that book appears in the hand of Elmer C. Lundquist. My handwriting also appears in several places. That is the book into which the readings of these tests were entered. 428 The entries made in the note book were made at the same time the readings were taken. Figs. 4, 5 and 6 are graphs of test data obtained by testing the Anthes Flare No. 2, (Exhibit I). In each of the three graphs the horizontal dimension measures the wick height in inches above the top of the wick tube. The solid line appearing on each of the three graphs indicates tests performed with the flame guard and receptacle in place. The dotted line indicates tests that were performed without the flame guard in place, but with the regular receptacle in place. 429

Figs. 4, 5 and 6 represent still air conditions. In Fig. 4, the vertical dimension measures of fuel consumption in pounds per hour. In Fig. 6, the vertical dimension measures illumination in foot candles. In Fig. 5, the vertical dimension measures efficiency. In Fig. 4, the three dots on the solid line represent the results of test information, and the crosses in the dashed line represent points obtained from test information. In Fig. 5, the two crosses represent two different tests on two different days under the same controlled condition.

430 The two dots represent the results of two different tests performed under same conditions on two different days. In Fig. 4 is shown that the fuel consumption of the Anthes flare No. 2 is greater with the flame guard and regular receptacle than it is without the flame guard but with the regular receptacle. It also shows that the fuel consumption increases as the wick height increases both with and without the flame guard. In Fig. 6 it is shown that the illumination without the flame guard and with the regular receptacle is greater than the illumination with the flame guard and with
431 the receptacle and, also, that the illumination both with the flame guard and without the flame guard tends to increase as the wick height increases. Fig. 5 indicates that for the Anthes flare without flame guard but with the regular receptacle, the efficiency is higher than for the same flare with the flame guard and receptacle, and, secondly, that the efficiency without the flame guard tends to decrease as the wick height increases and that the efficiency with the flame guard tends to increase as the wick height increases.

The three graphs marked Figs. 7, 8 and 9 were
432 prepared by Elmer C. Lundquist under my supervision and direction from the test data contained in Exhibit 38. The points, whether they be crosses or dots, appearing on each exhibit have the same significance, were obtained in the same manner and represent test data, as I testified with reference to previous Figs. 4, 5 and 6. These graphs have to do with Figs. 7, 8 and 9 which are drawn from test data obtained on the Toledo flare marked by us No. 8B and identified herein as Exhibit G.

The tests represented in Figs. 7, 8 and 9 were run in still air. In each of the three figures, the

horizontal dimension measures wick height in 433
inches. In Fig. 7, the vertical dimension represents fuel consumption in pounds per hour. In Fig. 9, the vertical dimension measures illumination in foot candles. In Fig. 8, the vertical dimension measures efficiency. In Fig. 7, these curves indicate that for the still air condition the fuel consumption is greater without the flame guard than with the flame guard and, secondly, that the fuel consumption without the flame guard tends to increase as the wick height increases, and that the fuel consumption with the flame guard tends to remain constant as the wick height increases. In 434
Fig. 9 it is shown that in the still air condition, the Toledo burner 8B, the illumination in foot candles is greater without the flame guard than with the flame guard, and, secondly, that the illumination without the flame guard increases with the wick height while with the flame guard the illumination remains constant as the wick height increases. With reference to the degree of illumination shown in Fig. 9, with the flame guard the illumination was extremely small.

In Fig. 8 are shown the variations of efficiency of the Toledo burner 8B without the flame guard 435
and with the flame guard, and, secondly, that the efficiency without the flame guard tends to decrease as the wick height increases, while the efficiency of the same burner with the flame guard tends to remain constant as the wick height increases.

The three graphs marked Figs. 10, 11 and 12 were prepared by Elmer C. Lundquist under my supervision and direction from data contained in Defendant's Exhibit 38. These figures represent test points obtained on the Anthes Y flare (Exhibit

436 H) at variable wind velocities. Except for the split receptacle on Defendant's Exhibit I, and the absence of the split receptacle on Exhibit H, I having been identified by me as No. 2 and H as No. Y, I did not find any differences in the two flares. Referring back to Figs. 10, 11 and 12, in each of the three exhibits the horizontal dimension measures the wind velocity or air velocity in miles per hour. In each of these exhibits the solid line represents test points for the Anthes flare Y with the flame guard and split flame guard receptacle. The dashed line represents the same for the case without the
437 flame guard but with the split flame guard receptacle. The dotted line represents similar tests for the flare without the flame guard and without the split flame guard receptacle. That is true of each of the three graphs.

In Fig. 10, the vertical dimension measures fuel consumption in pounds per hour. In Fig 12, the vertical dimension measures illumination. The two dots on Fig. 12, at about 4.6 miles per hour, represent test points obtained on two different days under the same conditions. The line has been drawn relatively between them. In Fig. 11 the ver-
438 tical dimension measures efficiency. In Fig. 10 the solid line indicates that for the case with the flame guard and split flame guard receptacle, the fuel consumption increases to a point at approximately two miles per hour, then decreases to a point approximately five miles per hour and then increases again to a point approximately eight and a half miles per hour. The dot-dash line representing tests made with the split receptacle on but the flame guard off indicates the same tendencies. With reference to the tests when the flame guard and

its receptacle were both removed, the same tendencies are indicated. 439

In Fig. 12 the solid line indicates that the Anthes flare Y, the illumination increases from the still air condition up to a point of about 2 miles per hour, then decreases to a point at about 5 miles per hour, and then increases again to a point about 8½ miles per hour. The dot-dash line for the case without the flame guard but with the split receptacle shows somewhat the same characteristic, and, for the case without the flame guard and without the split receptacle, that is the dash line, the illumination decreases from the no-wind velocity up to approximately 4½ miles per hour and then tends to remain constant up to a wind velocity of about 8½ miles per hour. 440

In Fig. 11 is shown that the efficiency with the flame guard and with the split flame guard receptacle, it tends to decrease from the still air condition to about 5 miles per hour and then tends to increase to a point of about 8½ miles per hour. The dot-dash line without the flame guard but with the split receptacle shows a decreasing tendency from the still air condition, and the dash line for the case without both the flame guard and split receptacle indicates a decreasing tendency up to a velocity of about 8½ miles per hour. The most efficient device under still air conditions was the case without the flame guard but with the split receptacle. The least efficient device under still air conditions was the case with the flame guard and with the split flame guard receptacle. At air velocities greater than approximately 1 mile per hour, the flare with the flame guard and with the split flame guard receptacle was the most efficient. 441

The three graphs marked Figs. 13, 14 and 15, re-

442 spectively, were prepared by Elmer C. Lundquist under my supervision and direction from data contained in the notebook which has previously been identified as Defendant's Exhibit 38. These figures show test results obtained from the Toledo flare 8B. That is the same flare which has been heretofore identified on this hearing as Defendant's Exhibit G. These tests depicted in these figures were conducted both in still air and at variable wind velocities. The horizontal dimension on each of the exhibits measures the wind velocities. In Fig. 13, the vertical dimension measures fuel
443 consumption in pounds per hour. In Fig. 15, the vertical dimension measures illumination in foot candles. The vertical dimension in Fig. 14 measures efficiency. In each of the three exhibits the solid line represents the Toledo flare with the flame guard in place. The dotted line indicates the Toledo flare without the flame guard. On each of the three exhibits the dots in the solid lines and the crosses in the dotted lines indicate test points obtained from testing these flares. In Fig. 13 is shown that the fuel consumption in pounds per hour of the Toledo flare with the flame guard was
444 greater than that of the same flare without the flame guard at velocities approximately greater than 1 mile per hour, and that in still air conditions the fuel consumption of the Toledo flare without the flame guard was greater than the same flare with the flame guard. Fig. 15 indicates that the illumination of the Toledo flare with the flame guard is greater than the illumination without the flame guard at air velocities of approximately 1½ miles per hour, and greater, and that at the still air condition, the illumination without the flame guard is greater than the illumination with the

flame guard on the same flare. In Fig. 14 is shown 445
that our tests on the Toledo flare No. 8B, the efficiency without the flame guard is greater at all points than the efficiency with the flame guard on the same flare. That was true in both still air and in conditions where air velocity was present.

We made tests to determine what effect, if any, the variation in the height of the fuel in the reservoir might have on performance. Figs. 16, 17 and 18 were prepared by Elmer C. Lundquist under my supervision and direction, under data taken from tests and recorded in the book heretofore identified as Defendant's Exhibit 38. These fig- 446
ures represent test data obtained on the Toledo flare 8B, the same flare which has been heretofore identified as Defendant's Exhibit G. In each of the three figures the horizontal dimension measures the fuel level recession. The fuel level recession is the distance from the top of the wick tube to the kerosene level in the base of the flare. The distances of 1⅛ inches, 2⅛ inches, and 3⅛ inches below the top of the wick tube were taken in these tests. The tests shown on Figs. 16, 17 and 18 are tests having still air conditions. In Fig. 16 the vertical dimension measures the fuel consumption in pounds per 447
hour. In Fig. 18 the illumination in foot candles is measured by the vertical dimension. In Fig. 17 the efficiency is measured by the vertical dimension. Fig. 16 shows that for the Toledo No. 8B flare, the fuel consumption in still air with the wick height of ⅜ of an inch was greater without the flame guard than with the flame guard for all tests, and, secondly, that the fuel consumption tends to decrease with fuel level recession for the flare, both without the flame guard and with the flame guard.

448 In Fig. 18 is shown that our test points indicate that the illumination without the flame guard in still air and having a wick height of 3/8 of an inch, was greater without the flame guard than with the flame guard and, secondly, that the illumination without the flame guard tends to decrease with the fuel level recession and also that the illumination with the flame guard remaining constant as the fuel level recession was increased. In Fig. 17 are shown that our tests indicated that the efficiency of the Toledo flare 8B in still air and with the wick height 3/8 of an inch is greater without the flame guard than with the flame guard, and, secondly, that the efficiency without the flame guard tends to decrease and increase slightly as the fuel level recession increases and that with the flame guard the efficiency is practically constant as the fuel level recession increases. On Figs. 4 to 18, both inclusive, the initials HOC are in my handwriting, and the initials ECL are in Elmer Lundquist's handwriting. In connection with the tests about which I have testified, observations were made with reference to wick consumption. We determined that within the period of greatest use of the flares, continuously burning, which is a six-hour period, that it was impossible to detect any consumption in the wick by measurement with a rule. This was true for both the Anthes and Toledo types of flares. In our measurements with a rule in attempting to determine whether there was any wick consumption, or not the nearest 1/120th of an inch could be estimated with the flame guard in position, and with the flame guard removed.

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Q213. With the data obtained by you and Mr. Lundquist from the tests about which you have just been testifying, and the graphs of performance as

they were prepared, will you state what conclusion, 451
if any, you have reached with reference to the performance of the Toledo flare when the flame guard was in place as contrasted to its performance when the flame guard was removed? In connection with this question I hand you the series of graphs to which you may refer if you so desire. A. We found that for the Toledo flare No. 8B, that the efficiency without the flame guard was greater than it was with the flame guard as shown in Fig. 8, or the still air condition; and, that the same thing was true at variable wind conditions as shown in Fig. 14. That the illumination as shown in Fig. 9 was 452
greater without the flame guard than with the flame guard for the still air condition, that at velocities of approximately 1½ miles per hour the illumination with the flame guard was greater than without the flame guard.

That was Fig. 15. That was at variable wind velocities greater than 1½ miles per hour. And, that the fuel consumption as shown in Fig. 13 was greater with the flame guard than without the flame guard for approximate wind velocities greater than 1 mile per hour. That in Fig. 7 the fuel consumption was greater without the flame guard than with 453
the flame guard at variable wick heights, under still air conditions. And, that in Fig. 9 the illumination without the flame guard was greater than it was with the flame guard at variable wick heights under still air conditions. That the efficiency as shown in Fig. 8 in still air conditions was greater without the flame guard than with the flame guard for variable wick heights. In Fig. 16 the fuel consumption without the flame guard was greater than it was with the flame guard at variable kerosene levels, in still air conditions. And,

454 in Fig. 17 the efficiency was greater without the flame guard than with the flame guard as the kerosene level decreased in still air. And, in Fig. 18, that the illumination without the flame guard was greater than with the flame guard in still air conditions as the fuel level decreased. In connection with the making of these tests we informed ourselves as to the average wind velocities throughout the continental United States. We found by referring to the 13th Edition of the American Society of Heating and Ventilating Engineers' Guide, 1935, on pages 136 and 137, a table which
455 shows the average wind velocities at specified points in all states of the Union and Canada for the heating season, and in this we find that the maximum average wind velocity has been found at Buffalo, New York, and is 17.7 miles per hour, and that the minimum average wind velocity condition is found at Lander, Wyoming, and is 3 miles per hour.

Q221. Referring again to the tests, Professor Croft, will you state what conclusion, if any, you reached with reference to the performance of the Anthes flare with a flame guard in place as con-
456 trasted to its performance without the flame guard in place, or with simply the cup for the flame guard in position? A. The performance of the Anthes Y flare with and without the flame guard receptacle is shown in Figs. 10, 11 and 12 and shows that the fuel consumption as shown in Fig. 10 is greater without the flame guard but with the split flame guard receptacle than it is without the flame guard and without the split flame guard receptacle for velocities greater than approximately 1½ miles per hour, and that at the still air condition, the consumption without the flame guard and without the

split flame guard receptacle is greater than with 457
the flame guard but with the split flame guard receptacle. Fig. 11 shows that our test results indicate that for the Anthes burner Y, the efficiency without the flame guard but with the flame guard receptacle, is higher at the still air condition than it is without the flame guard and without the split receptacle. That these two above curves intersect and cross at velocities of approximately .6 miles per hour and 2½ miles per hour, and that for velocities greater than 2½ miles per hour the efficiency without the flame guard but with the split receptacle is greater than without the flame guard 458
and without the split receptacle. Fig. 12 indicates that the illumination in foot candles in still air of the Anthes Y flare is greater without the flame guard and without the split receptacle than it is without the flame guard but with the split receptacle. This is true up to a velocity of approximately 2 miles per hour, and the reverse is true at higher velocities than approximately 2 miles per hour.

Q222. With reference to the same Exhibits, what conclusion did you reach with reference to performance with the flame guard as contrasted to the 459
two other conditions shown on the graphs when the flame guard has been put in place as contrasted to the entire absence of a flame guard and split receptacle, or the presence of the split receptacle only, what is true about the performance? A. The use or the addition of the flame guard to the receptacle increased the illumination at velocities greater than roughly .5 miles per hour, and lowered the illumination at the still air condition, as shown in Fig. 12. In Fig. 11, the addition of the flame guard to the receptacle increased the effi-

460 ciency at the velocities approximately greater than 1 mile per hour, and at the still air condition decreased the efficiency. In Fig. 10 the addition of the flame guard increased the fuel consumption at perceptible velocities, but, at the still air condition, decreased the fuel consumption under that of the flare without the flame guard and without the split flame guard receptacle, but increased it above that at the still air condition of the flare without the flame guard but with the split flame guard receptacle.

I have seen a copy of Patent No. 1,732,708,
461 marked Plaintiff's Exhibit 1. I have examined it and compared it with the Anthes structures as exemplified in Defendant's Exhibits H and I. I find several differences in construction between Exhibit H and I and the Figure 1 of the patent noted. First: That the flame guard receptacle of the Anthes burner is elevated at approximately ½ inch distance above the body of the flare. Such construction is not indicated in Figure 1 of the patent noted. Secondly: I notice the location of the air ports in the Anthes burner are at the base of the flame guard receptacle while in the Figure
462 1 patent drawing the air ports are in the fuel guard itself. Third: That in Figure 1 of the patent drawing there is a hemispherical shaped member marked 11 in the patent drawing which is completely absent from the Anthes burner. In Figure 3 of the patent drawing I find again the difference in air port location as in Figure 1, and, secondly, that in Figure 3 of the patent drawing there is a wick tube extension marked 11a, 12a, which is totally absent from the Anthes burner. By referring to Fig. 11, representing tests on the Anthes Y, and Fig. 14 on the Toledo flare 8B, I find that

the performance characteristics of these two types of burners are very different. In Fig. 11 is seen that the efficiency of the Anthes burner decreases from the still air condition down to a wind velocity of approximately 5 miles per hour, then increases until a velocity of about 8½ miles per hour is attained, while in the Toledo flare No. 8B, the efficiency increases from the still air condition to a maximum point of about 5 miles per hour and then decreases to a point at about 9 miles per hour. 463.

I find that at perceptible wind velocities, addition of the flame guard to the Anthes flare results in increased efficiency, while in the Toledo flare 8B, as shown in Fig. 14, the addition of the flame guard decreases the efficiency. It is my opinion that the difference in performance of the two flares can be accounted for by the difference in construction of the two flares. That is, in the Toledo flare, the wick and flame guard are adjacent to the top of the body of the flare and the air ports are in the flame guard, the sides of the flame guard, while in the Anthes flare the wick and receptacle are elevated above the body of the top of the flare and the air ports are at the bottom of the flame guard receptacle. 464 465

In referring to Fig. 14, it is quite apparent that the addition of the flame guard to the flare without cover has reduced the efficiency.

In Fig. 13 is shown that the fuel consumption has been increased by the addition of the flame guard for velocities approximately greater than 1 mile per hour. In the still air condition, the fuel consumption has been decreased.

In Fig. 15 is shown that the addition of the flame guard to the unguarded flame of the Toledo flare 8B has resulted in an increased illumination at

466 velocities approximately greater than 1½ miles per hour, and that at the still air condition the addition of the flame guard reduces the illumination.

Q238. Now, directing your attention to the specifications of Patent 1,732,708, Plaintiff's Exhibit 1, and particularly to lines 93 to 96 on page 1 of the specifications, reading as follows: "With the above described construction and arrangement, the oil consumption is materially decreased." From the tests of this device which you made, did you reach a conclusion as to the truth or falsity of that statement? A. We found that for the still
467 air condition, the addition of the flame guard to the uncovered flame of the Toledo flare resulted in a reduced fuel consumption, but, at velocities higher than approximately 1 mile per hour, the addition of the flame guard to the open flame of the Toledo flare resulted in an increased fuel consumption.

We found that as shown in Fig. 9, that in the still air situation the illumination of the Toledo flare 8B was extremely low, and that adding the flame guard to the open flame decreased the illumination enormously. It is my opinion that the increased
468 consumption in fuel at wind velocities of approximately 1 mile per hour, as shown in Fig. 13, is due primarily to heat transmitted to the base of the flare by conduction, and that the heat so transmitted to the top of the flare body and the wick tube vaporized the fuel arising in the wick tube, thereby assisting the natural evaporation process.

The efficiency of a flare consists not only in the vaporizing of fuel properly but in also inducing a proper amount of air at the proper temperature and at the proper place.

Cross Examination by Mr. Owen: 469

The Witness: These flares are used for warning signals on the highways to warn motorists of trucks in distress and they might be used for warnings of openings in pavements or something like that. At night, of course. When I made the tests to which I have referred, I knew what these flares were used for. I had information regarding the requirements of the various State Highway Departments as to the tests which flares must be able to pass in order to be adopted and used as flares. I had two publications, I think, which gave 470
the specifications and requirements for truck flares. I don't believe it is for the State of Iowa. I might have, I forgot which states they are. No one instructed or directed me as to the character of the tests which I was to make. Knowing the requirements of the state highway departments I proceeded to outline and conduct these tests on my own responsibility. I knew, from reading these requirements to which I have referred, that there was also a rain test which flares must pass before they could be approved for use on the public highways. I made no effort to conduct any rain tests. 471
I do not recall whether the pamphlets which I saw required a rain test. I suspect they did. I did not know that the requirements of the State of Iowa, at the time I made these tests, included a test at 40 miles per hour of wind velocity. I stated that our testing apparatus was capable of developing a wind velocity of 33 miles per hour. I stated that both the Toledo and Anthes torches, Exhibits G and H and I, remained lighted at our maximum wind velocity of 33 miles per hour. In these graphs which I have produced, we stopped all or prac-

472 tically all of our tests at about 8½ miles per hour. I decided the tests should not be carried beyond that point. I referred to an engineers' handbook showing an average wind velocity at various points. That handbook does not contain any data regarding the maximum and minimum velocities at the points for which the averages are given. The table indicates that these average wind velocities were compiled from Weather Bureau records, and I suppose that means at the city indicated here in this list. I would assume that these averages were obtained over a long period of time by taking the
473 wind velocities at given time intervals, adding all the wind velocities together and dividing by the time interval. And the result is the average given in this table. This data on pages 136 and 137 of this handbook was made up for the use of heating engineers in determining the radiation for heating houses. What they were interested in was the average wind velocity rather than maximums and minimums.

I did not receive any instructions from Mr. Wisner or Mr. Anthes or others as to the wick extension I was to use in making these tests. I do not
474 know what the practice is or has been with respect to wick extension in the open flame burner, that is, a burner without flame guards. I assumed nothing as to wick exposure. We merely ran the tests under conditions indicated. It seemed to us that the maximum wick height of ⅜ of an inch was a reasonable wick height with the flame guard in place. We varied the wick height merely to determine the effect of wick height, at the range of wick heights tested, to determine whether wick height was a variable.

XQ27. Did you assume that the same wick ex-

posure would be appropriate under conditions of actual use for flares equipped with flame guards and flares which were not so equipped? A. It was my opinion that the devices tested were not flares without protection, and our tests, in my opinion, have nothing to do with unprotected—types of unprotected flares. My tests and my testimony cannot be assumed to mean or to indicate that an unprotected flare would be usable as a warning signal or as a flare. 475

XQ29. You wouldn't recommend to Mr. Anthes or anyone else, the manufacture and sale of an unprotected flare, would you, for use as a warning signal? A. I cannot answer that question definitely. Under certain conditions I might recommend a manufacturer undertake to manufacture unprotected flares. 476

XQ30. But not for use as warning signals on public highways? A. It is quite even possible I might suggest that. That is, I can conceive of a flare which is unprotected which might be suitable for the highway.

XQ31. But it would not be one of these before the court? A. I have never thought of that question. I wouldn't care to express an opinion. 477

XQ32. To be specific, would you recommend to Mr. Anthes or to any other manufacturer who asked your advice, that any of the flares which you have under consideration today, be sold for use as warning signals without the flame guard? A. It is quite possible that flares of that type might not be salable, but, before I would recommend to any manufacturer whether he should manufacture that type of flare, I would consider the question as to whether that type of flare was salable for highway protection.

478 XQ33. From your knowledge of the requirements prescribed by the highway departments, would you say that one of the flares which you have had under consideration today would be usable without the flame guard? A. I have no knowledge.

My information relative to state requirements for highway flares is extremely limited, but that doesn't preclude my ability to determine the characteristics of these two flares as indicated in the testimony. The Toledo wick, assuming that it is 13/16 of an inch in diameter, will have approxi-
479 mately 25% greater evaporating area than the Anthes wick, assuming it is 21/32 of an inch in diameter. The Toledo wick would not necessarily give a correspondingly larger flame. The size of the flame would be a function of both the wick diameter, that is, a function of the evaporating surface, and also the accessibility of air to the evaporating kerosene.

The term "luminescent" as applied in claim 11 of the patent in suit to the flame, indicates, to my mind, that the flame is visible to the naked eye. Luminosity has to do with the source of light and
480 illumination has to do with the light receiver or surface to which the light is propagated. I would think luminosity means visibility. In a general sense illumination means visibility. In technical language, luminosity is the amount of light emitted by a source, point source, expressed in candles. Illumination is the amount of light received by a surface and expressed in foot candles.

The luminosity of a flame does not necessarily increase with the illumination resulting from that flame. Luminosity might increase more or less than the illumination. The irregularity of a flame

would affect its luminosity and its illuminating 481
qualities in the same way. The visibility of a flame from a distance would increase or decrease in accordance with the increase or decrease of illumination resulting from that flame, provided the eye and the illuminated surface were at the same distance away from the flame.

Referring to the question of wick exposure, if I wished to produce a flame of the same size in the Toledo and Anthes torches, taking into consideration the difference in the sizes of the wick, the natural thing to do would be first to try and increase the diameter of the wick in the Anthes 482
burner. Assuming that the sizes are fixed, as I have given them:

At no wind velocity, the question is hypothetical, as the illumination in all cases for the Anthes burner Y. as exhibited in Fig. 12, is already greater than that shown in Fig. 15; in all cases, both with and without the flame guard, that condition apparently prevails until a velocity of approximately .6 mile per hour is attained for the case without the flame guards. Above this velocity without the flame guards, the question is answerable, and it is my opinion that lowering the 483
receptable of the Anthes burner and fastening it to the top of the burner base would increase the fuel consumption and possibly the illumination. With the flame guard, and above the velocity of approximately 2 miles per hour, the illumination given by the Toledo flare with the flame guard again becomes greater than that of the Anthes flare and the illumination of the Anthes flare might be increased by again moving the receptacle of the Anthes flare down to the top and fastening to the

484 top of the base of the flare and drilling the air ports in the side of the flame guard.

By far the biggest majority of our tests were conducted at 3/8-inch wick heights. These observations were obtained under those conditions. The circular and instruction sheet which I produce, marked Plaintiff's Exhibits 4 and 5, were in the box with the Toledo flares which I purchased. I think I glanced at these hastily before I made the tests: I didn't read them with any particular care. This paper which I produce, marked Plaintiff's Exhibit 6, is a paper similar to the one which came
485 with the Anthes torches.

Redirect Examination by Mr. Wisner:

The Witness: With reference to the tests which we were conducting, we were not seeking to determine whether any of the torches which we tested satisfied any requirements of highway commissions and the qualification of torches. That particular question was quite foreign to the determining of the performance characteristic of the two different types of torches. In making the tests about which
486 I have testified, I did not make any observation of wind velocity at more than 10 miles per hour. May I make a correction? The test for extinguishing the burners both with and without a flare cap were made at velocities greater than 10 miles per hour. The performance tests at variable velocities were all conducted at velocities lower than 10 miles per hour. The reason these tests were conducted below a velocity of 10 miles per hour was because at a slightly higher velocity one of the flares was extinguished without the flame guard, and, since we were interested in determining the performance of

these flares with and without the flame guard, we felt it was useless to continue testing at velocities above which one of the flares was extinguished without the flame guard. On cross examination, with reference to an open flame torch, I was interrogated about what the practice has been with respect to wick extensions above the wick tubing in open flame guards. I am not aware that there has been any practice with respect to that. From the tests I made I did not form an opinion of the proper height at which the wick should be extended in testing a flare without a flame guard. 487

The reason 3/8 of an inch wick height was selected for the majority of these tests was because we found that with this wick height for both the Anthes and Toledo flares, the illumination without the flame guard in still air was practically the same as shown on Fig. 6 and Fig. 9, roughly at an illumination of 3 foot candles. In other words, if we start with both flames unguarded and we find at 3/8 of an inch wick height, both flames have or render approximately the same illumination with the same wick height, we at least have one condition at which the variable of wick height may be discarded for the uncovered flame. Since there are a large number of variables possible in testing any one flare it is necessary in order to get comparative results to obviate as many variables as possible. In the case of wick height, we maintained it at 3/8 of an inch and because of this, had nearly identical performance of both uncovered flames. We maintained the kerosene level for the majority of tests at 1 1/8 inches below the top of the wick tube. Obviously, had we not kept the kerosene level constant for the majority of the tests, another variable would have been introduced. We do not know from 488 489

490 our tests that 1⅛-inch kerosene level is the best operating level for both flares. However, in our test work, if we kept the kerosene level at this condition, we have at least obviated the necessity of correcting for this particular variable on the majority of our tests. We were interested in determining the difference in operating characteristics of two types of flares, not the most efficient operating condition for either type of flare, in the hopes that if such operating characteristics were found to differ, that naturally there must be some difference in the fundamental dimensions of the two
491 types of flares. As to whether or not one of these flares which I tested with the flame guard would be acceptable under the requirements established by the various highway commissions or by the other authorities passing on the qualifications of flares, in testing these unprotected flares, I was not seeking to determine whether either of them would meet any such qualifications.

If the Weston illuminometer were placed on top of a desk over which was a desk lamp, it would indicate in the neighborhood of approximately 10 foot candles. If it were placed on the center of a
492 floor in a relatively well windowed room in the day time, it would indicate approximately 3 foot candles. I was asked a question phrased approximately as follows: "Would the irregularity of a flame affect its luminosity and its illuminating qualities in the same way?" In my answer to that question, I understood the word "irregularity" to mean fluctuation in the luminosity of the flame, I was thinking of a waver in a fluctuating light source.

Recross Examination by Mr. Owen: 493

The Witness: In the tests I made of the Toledo and Anthes burners without the flame guards and in which the flames were extinguished at approximately 11 and 15 miles wind velocity on the average burners, the wick extensions on both burners for the extinguishing test was 3/8 of an inch.

DEPOSITION OF ELMER C. LUNDQUIST EXAMINED ON BEHALF OF DEFENDANT AT IOWA CITY, IOWA, JANUARY 18, 1938

494

ELMER C. LUNDQUIST, being duly sworn, testified as follows:

Direct Examination by Mr. Wisner:

The Witness: My name is Elmer C. Lundquist. My legal residence is Moscow, Idaho. At the present time I am taking graduate work in mechanical engineering at the University of Iowa, and I hold a reserve assistanceship in mechanical engineering in that institution. I participated as observer in a series of tests made on the Anthes and Toledo 495
flares, heretofore identified by Professor Croft as Defendant's Exhibits G, H and I. The average run was of one hour's duration in each case. In those tests no readings were recorded or observed before the flare had burned six minutes.

I have seen the document marked Defendant's Exhibit 38 for identification. The majority of the portions of the document are in my handwriting. The entries that appear therein were made during the course of the tests. The entries representing the readings of the test by the Weston illumino-

496 meter and Boyle velometer were made approxi-
mately simultaneously with the taking of the read-
ings. I prepared the series of graphs which have
been marked Figs. 6 to 18, both inclusive. I com-
puted points on these graphs from data taken from
this day book identified as Exhibit 38. In the case
of those graphs showing the various variables
plotted against wind velocity, each point repre-
sents 96 readings of the instruments. In the cases
of still air, the test run with still air, I made 48
observations of illumination with the exception of
two or three cases where the Toledo flare No. 8B
497 with the flame guard, and in those cases I made
only 24 observations of the Western illuminometer
during the hour. By referring to Fig. 9, the case
of the line showing the results for the Toledo flare
8B, giving illumination for different wick heights,
it will be noticed that the illumination was very
low, approximately 6/100 of a foot candle. For
this reason, due to the fact the reading was very
low, the Weston illuminometer did not fluctuate a
great deal, didn't fluctuate enough to be noticeable.
That being the case, I thought it would be suitable
only to take 24 readings instead of 48 as I had
498 done in the other tests.

I have previously participated in the making of tests and reduced the data obtained from those tests to the graphical form. I filled in the curves as they appear on these graphs. In my opinion the curves were filled in with accordance with the standard engineering practice. Each point fixed on the graphs was arrived at by averaging the values obtained from the test. For instance, during those cases where I took 48 velocity readings during the hour, I added these 48 readings together and divided by 48, and that was the average value used

to plot these curves. A similar method was used 499
with the other measurements taken. I made the calculations. To the best of my knowledge the calculations are true and correct. Referring to Exhibit 38 for identification, the entries I made in there in my own handwriting to the best of my knowledge, these entries are correct and true.

PLAINTIFF'S REBUTTAL

ROBERT A. CURRIE, called as a witness on behalf of the plaintiff, in rebuttal, having been duly sworn, testified as follows: 500

Direct Examination by Mr. Darby:

The Witness: I reside in Syracuse, New York; I am fifty-eight years of age, and am connected with The R. E. Dietz Company. I am works manager of their factories. I have entire charge of all the production of the Dietz Company. The Dietz Company is the largest manufacturer of lamps and signal lamps in the United States. They are the oldest company engaged in the manufacture of that type of product in the United States. The business 501
was founded in 1840. I have been with that company since 1903.

Up until about 1923 or 1924, or thereabouts, our company made and sold lanterns for signal purposes, warning purposes. The ordinary tubular lantern with red globes. The company subsequently engaged in the manufacture and sale of a flare of the torch type. Our engaging in that manufacture was occasioned by the fact that the torch which had been on the market by the Toledo people about a year, and that was the reason we went

502 in the business. We did not want to go into the manufacture of torches and flares, we put it off for a year. We were compelled to do so by the loss of sales and the requests we were receiving from our jobbers for a light article. When we decided to go in the business of manufacturing a flare or torch, the first step that we took in that direction was to obtain one of the open wick type Toledo torches. That was a type exactly similar to Plaintiff's Exhibit 10. That is what was on the market at that time. It was competition from these devices that caused us to go into the ques-
503 tion. After I obtained this Toledo torch I experimented with it for the better part of that year, the year 1928, I think it was. The purpose of my experimentation was that we first wanted to substantiate the claims made by the Toledo Company and see if we could find any flaws in them, and I felt that sooner or later we would have to go into that same business, so I wanted to be prepared.

As a result of my experimentation with the open wick type of torch of the Toledo Company, like Plaintiff's Exhibit 10, I found they used a great deal of oil. I found they were not weatherproof,
504 particularly in rain, and they would not stand up against winds unless the wick was raised considably above the burner. At about ½-inch wick extension above the burner it would withstand about 35 miles an hour. If you raise it up about 2 inches it would perhaps stand a 40 mile an hour wind. I can say that it would.

The Court: How about rain?

The Witness: It would not stand up in heavy rain. There was nothing to protect it at all.

In determining to bring out a device ourselves we

were endeavoring to produce one which would over- 505
come those defects in the Toledo torch. And that experimentation over that year's period of time included efforts on our part to improve on the open type Toledo torch. I had charge of that work. It was continuous and extensive throughout the better part of that year.

I have about 14 inventions to my credit. Patented inventions. I have three pending applications for patents.

I have a Thatcher gas range in my home, made over here in Newark, New Jersey. I am familiar with the pilot light cap on that stove. It is the 506
same thing as the one attached to Defendant's Exhibit L. In 1928, I was familiar with the type of cap on my gas stove. We moved into our present house in 1922, so at that time I must have been acquainted with that fully six years. I have the same stove and have had throughout that period. I had personal familiarity with it. I had occasion to examine it and take it apart and clean it during that period.

During my experimentation to produce a flare or torch to be sold in competition with the open wick type of the Toledo Company, I produced a 507
number of different types of devices, wick holders and wick protectors.

Q41. I hand you three wick holders or protectors, and I ask you if you can identify them as structures which you originated, created and tried out with that object in mind? A. This one here was one of them. This was our original burner (indicating), and then I put this cap (indicating) over the flame so as to protect it.

Q42. My question was do you identify all three

508 of those? A. Yes. I identify this one also (indicating).

Mr. Darby: I offer the first one referred to by the witness in evidence.

(The device was received in evidence and marked Plaintiff's Exhibit 37.)

Q43. And you identify this second one? A. Yes.

Mr. Darby: I offer that in evidence.

(The device was received in evidence and marked Plaintiff's Exhibit 38.)

The Witness: Not this one, because this followed in 1930 (indicating).

509 The Court (to the witness): When did you experiment with Plaintiff's Exhibit 37?

The Witness: That was in 1928.

The Court: And when did you experiment with Plaintiff's Exhibit 38?

The Witness: That was in 1929.

Q44. I find that I gave you a wrong one. Do you recognize this (indicating)? A. Yes, I identify this. That was one I experimented with in 1928, also, along with the other one.

Mr. Darby: I offer this third one in evidence.

510 (The device was received in evidence and marked Plaintiff's Exhibit 39.)

Q45. Am I correct in understanding that each of these three exhibits, 37, 38 and 39, were actually structures produced by you as part of this intensive experimentation on your part, in the effort to produce a flare which would withstand wind, rain, weather conditions of a degree of improvement over the open wick type, Plaintiff's Exhibit 11? A. Yes, and I was also striving to get away from that long wick which consumed so much oil.

Q46. And did any of these devices prove to be

successful? A. Yes, with the exception of the protection against rain. 511

Q47. Did any of these devices that I have offered in evidence as Plaintiff's Exhibits 37, 38 and 39, prove successful—so as to cause its adoption by you as your commercial product? A. No, not to that extent.

Plaintiff's Exhibit 37, I believe, is the only one I found to be a successful one. That would operate with a much lower wick and withstand a very high wind.

Exhibit 38 developed in 1929 was not successful. I did not have a large enough combustion chamber 512
in that. It would blow out, and it was not protected from the rain either. Plaintiff's Exhibit 39 was not successful. It would rain out. No protection from the rain. After these experiments, our company came out with a competitive torch, one that was identical with Plaintiff's Exhibit 10. The circular which you show me is the circular of our commercial product.

Mr. Darby: The circular of the first Dietz structure is offered in evidence.

(Marked Plaintiff's Exhibit 40 in evidence.)

The Witness: Our experimentation did not pro- 513
duce a structure which I regarded as better than the open wick type of torch that we ultimately brought out. The wick in our commercial open wick torch had to be carried out about an inch and a half.

In January, 1929, they notified me from the New York office of the Toledo Economy structure.

Q59. Taking you back to the time that you as an inventor were endeavoring to produce a flare in 1928 which would withstand wind and rain, and being at that time and for many years prior to

514 that time, familiar with the burner cap on a gas stove, did that suggest to you any solution to the problem? A. No, it did not; it never occurred to me.

I first heard of the plaintiff's commercial structure, the enclosed flame type, in January, 1929, the company purchased one. They sent one up to me late in February of 1929. We subjected it to tests. Those tests were to determine whether or not it solved the problem that we had been unsuccssful in solving. As a result of our tests I found that it did solve the problem. It became evident immedi-
515 ately that if we desired to remain in the competing field we would have to have something as good. We started out to try to develop something as good during the year 1929. We worked from late February through to November, when we completed our new burner.

Q69. Was that period taken up in trying to devise a structure that copied the Toledo burner, or was it taken up in trying to devise a structure which did not copy it, but which would accomplish the same result? A. No, I made every effort to keep away from their construction. It was marked
516 "Patent applied for." I did not know what their claims were; and so we kept away from it. As a result of that work the structure, Plaintiff's Exhibit 38, was developed. That was one of the experimental burners.

The structure which you have now handed me is the completed burner, the final result of our experimentation, and was placed on the market.

Mr. Darby: I offer that structure in evidence.

(Marked Plaintiff's Exhibit 41 in evidence.)

The Court: How did that work?

The Witness: Perfectly. Some time later we 517
were notified that that structure was an infringement of the Withrow and Close patent here in suit. And as a result, negotiations were entered into between us and the patent owners. Those negotiations resulted in our company acquiring a license under the patent in suit. We are still at the present time a licensee under the patent. Our license agreement provides an obligation on our part to make available to the patent owners any facts which may be of value to them in connection with their patent; that accounts for me being here.

518

Cross Examination by Mr. Wisner:

The Witness: I think that some company manufactured an open flame torch prior to 1924 or 1925, but I couldn't tell you who did. There was nothing new about a warning signal of the type of Plaintiff's Exhibit 10 at that time. Our company simply did not make them, we were engaged in the manufacture of red lanterns. In 1928 I started experimenting, trying to improve this open flame torch. The experiments that I made were outdoor tests, both around the factory, and then we have a cot- 519
tage out about twenty miles, out at a lake, and I was experimenting there every day, principally at night only when I got home. I had the various structures made for me. In connection with those experiments I made an investigation of the art of lanterns. That is, I looked up what patents I could on torches. We have the Official Gazettes that go back for pretty nearly forty years, and I went through those.

The Court: Did you have Rutz and Malcov?

520 The Witness: No—that is, we had their patents in our collection.

The Court: I mean were you familiar with them?

The Witness: Yes, I was familiar with them, yes, sir, but I wasn't familiar with them in 1928; they did not appeal to me at all.

The Court: When did you become familiar with them?

The Witness: I do not think I became familiar with that, or that is, that it appealed to me until perhaps 1930, I would say around
521 that, 1930 or 1931.

The Court: What is the date in your case?

Mr. Darby: 1929, our patent issued in 1929. The filing date was December, 1928.

The Witness: In this search which I made I came across the British patent to Salsbury, we have a record of that patent. I couldn't say how long we have had that, about ten, twelve years, something of that sort. I never made or tested a model using that patent, in accordance with that patent. My first contact with kerosene or hydrocarbon burners was in 1903, that is, a hydrocarbon
522 burner is a lantern burner, and that goes back to 1903. But in the ones without a chimney around them it was in 1928. I started in the field fresh.

XQ94. You characterized your activities as continuous and intensive, as I understand, and you produced three different structures during a period of two years? A. I produced more than that, but these are the only ones that I happened to have handy there.

This one offered in evidence as Plaintiff's Exhibit 37 is the identical structure which I made back in 1928, I had it cleaned up because I did not

want to bring it down here all dirty. The same is 523
true of the other two offered in evidence. Referring to Plaintiff's Exhibit 38, the structure with an iron housing, that was made in 1929, after the Toledo Economy burner had come out. Plaintiff's Exhibit 37 burned very nicely in the open air when I experimented with it. I tried it out in the rain and it went out. It occurred to me that I might possibly put a flat shield over the top so the rain would not get in the center of the wick, that is, that thought must have been in my mind, but I just didn't do it.

XQ103. It didn't occur to you that by putting 524
an umbrella over that wick, it would be helpful in keeping it from being extinguished by the rain? A. There is no question I knew that, but how to go about it, I just didn't do it.

XQ104. And yet your efforts were intensive? A. It was practically daily; we were experimenting and burning them daily.

I have heard of Argand. That is, as I understand it, Argand was the originator of the tubular lamp.

I dismounted the Rutz structure because the
pilot light would go out, and then it was necessary 525
to take the cap off and use a very fine pin and open those little ports, I think there are four ports. The particular structure which I have in my stove was manufactured by Rutz, that is, it has Rutz' patent marking on it, I believe. It has a patent number on it and I think it was back in 1930 or 1931, I can't remember that, but I wrote to the Thatcher people asking them who made that burner, and they told me it was some firm in Milwaukee, some specialty company. I do not think I wrote to that company. I think I took that information and started to see

526 what I could find out about it. Then I discovered that we already had their patents in our files. That is, the Rutz patent and a Kahn patent too. At the time that I was making these intensive experiments that I referred to, I did not refer to those patents at all, it never occurred to me. We have hundreds, hundreds of patents in our file, that is, pertaining to lanterns. We index them.

XQ117. Do you mean to tell me you actually went through that file prior to starting your experiments here? A. Yes, I did.

This other little structure, Plaintiff's Exhibit 39,
527 was produced likewise in 1928. That did not function in the wind as good as that cup. The cup was the best in the wind that I ran across. Now, referring to Plaintiff's Exhibit 38 again, this particular structure was put out in the rain and burned. I would say that it was a good heavy rain, and it went out. I ascribe its going out to the openings on the side being too long, and just simply letting too much water in. It did not occur to me at that time that I might narrow that opening and obviate the difficulty.

Upon the top of Plaintiff's Exhibit 41 appears
528 three patent numbers, 1,732,708, 1,089,931 and 1,831,346. Two of those patents are the R. E. Dietz Company patents, and I believe the other one, 1,732,708, is the Toledo patent number. The one patent issued to us there covers that bail locking device that is incorporated into the original burner you have got over there. The other patent covers the burner as an entirety as you have it there, the sliding rain shield on the top, and its combustion chamber and its construction.

XQ131. In any condition except one in which a rather intensive rain is falling the structure oper-

ates, does it not, without this top rain shield over 529
the flame? A. Yes, I guess it does.

XQ132. It operates a little better without rain when this shield is removed, doesn't it? A. I wouldn't say so; it then becomes an open torch, it becomes an open torch burner subject to the varying wind currents.

XQ133. Well, what is the purpose of adding all of these devices so that you can take off the torch top if it doesn't operate better with the top off? A. You see, we are keeping the bail on that to serve as that lock. If you turn it up from the bottom you will see how it extends into the tube, and 530
then the cam pulls that out.

XQ134. You, however, advertise that under certain circumstances when rain is falling the structure should be in this fashion, and when it is not raining it should be positioned in the other fashion? A. It can be positioned in the other way, yes.

The claim made by the Toledo Company with reference to the operation of its torch similar to Plaintiff's Exhibit 10 was what led us into the business, they claimed that it was going to put the lantern industry out of business, and we did not 531
believe that it could. They also made some claim about its performance in wind and rain which led us to investigate its performance.

Re-direct Examination by Mr. Darby:

RDQ138. Take your mind back to an answer you gave which was stricken because you volunteered it. Will you state again why didn't the Rutz and Kahn patent for the gas burner art suggest themselves to you when you were seeking for a solution

532 of this problem? A. It would be a very difficult thing to say. It is one of those things which was right under my eyes, so to speak, and yet made no appeal to me. It was nothing new, I have had the same situation arise in lantern improvements.

The Court: What do you mean, right under your eye?

The Witness: Why, your Honor, it is very strange that improvements that we make that have been so obvious to us for a long time, suddenly we become aware of the fact that it can be done.

533 RDQ140. Rutz and Kahn, were they structures having to do with the burning of kerosene fuel:

The Court: They were gas.

The Witness: Gas.

RDQ141. Did you regard structures in the gas-burning art as the same or an analogous art to the kerosene-burning art?

The Court: He can testify to the fact, not as an expert.

A. No, I did not, no.

Our company keeps a current up-to-date file of patents pertaining to the art in which our company
534 is commercially interested. That was the practice in 1928, prior to 1928 and continuously since then. I first informed someone connected with the Toledo Pressed Steel Company, the plaintiff in this action, of the facts that I have testified to here on about February 9th, 1938, when I was down in New York.

JOSEPH E. WITHROW, recalled on behalf of the 535
plaintiff, in rebuttal, testified as follows:

Direct Examination by Mr. Owen:

Q198. When you became familiar with the testimony of Professor Croft and the graphs which were produced in connection with that testimony, how did the results to which he testified impress you, as to whether they were proper or improper results? A. They were contrary to my experience.

As soon as I got back to Toledo I told Mr. Close 536
about the experiments, so we obtained an Anthes torch and a Toledo torch and we placed them before the wind tunnel to verify or contradict the impression that I got from Mr. Croft's testimony. We placed the two torches in front of our own wind tunnel, to observe the effect of the wind tunnel on the torches. We found that when the torches were placed in the position that Mr. Croft placed them, his observation was correct, but if they were turned at an angle of 45 degrees, the reverse was true. I mean by that that the strip of metal between two of the flame ports was right in a direct line with the air stream. I did not conduct detail tests with 537
them, with that in view. Mr. Close conducted them after that.

Q206. On your testimony in chief, you said that you could blow out a Toledo torch, but you did not explain how. Will you state just how you blow out that torch? A. You place your lips very close to the flame port opening and blow with a sudden burst in a diagonally downward direction, and it will put the torch out. Sometimes it is difficult, but I have never seen one that I could not blow out that way.

Q207. Does that introduce any oxygen? A. Well,

538 you exclude oxygen. You have carbon dioxide coming from your lungs that you blow, and that would help.

I made tests of the Anthes burner with the flange which supports the cap partially cut away. I have here the device that I tested. This is the device, however, the burner was on that other torch body (indicating). But it was on an Anthes torch body. I tested that device before a wind. The results were that at 28.7 miles an hour it would be extinguished almost immediately, and at 26.9 miles an hour it would be extinguished almost immedi-
539 ately, and at 16 miles an hour it remained lighted, but at 16 miles an hour the flame all emerged from the holes that were cut in the flange in the bottom, and none of the flame came out of what we call our flame ports.

Mr. Owen: I offer that Anthes torch with the flange cut away, in evidence as a Plaintiff's exhibit.

(The same was received in evidence and marked Plaintiff's Exhibit 42.)

Mr. Wisner: What they have done, it is rather difficult to see, your Honor, but they
540 have cut away all of these air holes which we have in the bottom of this flange and substituted an almost completely open space. In other words, in the structure as it was intended to operate and which they claim we infringe, we have seven air holes in this bottom flange, that is Plaintiff's Exhibit 26.

The Court: I think having pointed out that, it may be marked in evidence.

Cross Examination by Mr. Wisner: 541

XQ214. To what wind velocity did you subject that device, Plaintiff's Exhibit 42? A. Wind issuing from a wind tunnel, using the restricted plates on the back of the wind tunnel that Mr. Close testified to the other day, and I was testifying to those exhibits as shown under the test that they made at that time, which the wind gauge measured.

I did not measure the wind at all. I assumed the same wind they had been measuring in the other trial. At 26.9 and 28.7 miles an hour it blew out, and then we took an observation at 16.3 miles an 542
hour. We did not take any observations below that velocity. We had no control below that. It burned a considerable length of time at 16 miles an hour rate. I did not measure it in minutes. It would go out within a few seconds at the 26 or 28-mile-an-hour rate. We used wick adjustment of three-eighths of an inch. I measured that.

XQ225. When you started the test at the 28-mile-an-hour velocity, had you permitted the flare to burn? A. It was an old wick.

XQ226. Had been used? A. Yes.

XQ227. Will you explain again, because I did not 543
understand it completely, and if necessary, will you point with reference to the flame coming out in the 16-mile-an-hour wind, where they came out? A. In the opening of what formerly was the flange.

That is, they came from underneath. This torch was positioned with reference to the center of the wind stream on the plate as shown in the photograph in evidence here. I think the burner itself was close to the middle of the wind stream. There was no difference in the position of the burner as shown in the photograph put in evidence. No

544 flames came out of the flame ports at all. I would not say that the flame ports were serving as air inlets. I am only testifying to what I observed. As I remember, the flame which came out from below would extend out there probably two inches. I did not make any measurements of oil consumption under those conditions. I did not make any measurements of the height of the fuel in the tank or the container at that time.

The Court: There are four flame ports?

The Witness: Yes.

The Court: Air blowing in from that posi-
545 tion, wouldn't that necessarily force the flame down?

The Witness: Not necessarily; it depends on the velocity, and also upon the position of the device in the wind stream.

The Court: I mean if it were in such a position that it was directed down with sufficient velocity, your flame would go down, wouldn't it?

Mr. Wisner: Oh, sure, your Honor.

The Witness: I understand in the state tests, they revolve the torch.

546 The Court: I suppose they put it all through various tests, in that position.

XQ239. Now, when you have a shield in the center of the wind stream, is that not a more favorable a position than when the wind stream is going directly through an orifice? A. No. I thought so myself until I found that the flame ports of the Anthes torch, parallel with the wind stream, that it gave off the best light, and at a 45 degree angle to the wind stream, then the light became blue and the candle power decreased.

The Court: Is it your testimony these holes

in the bottom do not make it as efficient as your light? Is that what you are saying? 547

The Witness: No. I was only testifying to these experiments that I made for the purposes, as I understand it—

The Court: You are just stating the fact?

The Witness: Just stating the fact.

My observation of illumination was by my eye only. I used no instrument to measure it. When the Toledo structure was placed with the air port parallel to the wind stream, it was quite blue. When the flame ports are placed parallel with the wind stream, the Anthes produces a very luminous 548 light, and the Toledo produces a blue flame. When they are turned at a 45 degree angle, the Anthes flame turns blue and the Toledo becames more lunimescent.

XQ244. The performance was different? A. Quite the opposite.

With the 16-mile-an-hour wind, with the Anthes torch, the flame coming from the bottom orifices or slots which I had drilled in the structure was visible. The flame was a little yellow.

LYMAN W. CLOSE, recalled on behalf of the plain- 549 tiff, in rebuttal, testified as follows:

Direct Examination by Mr. Owen:

The Witness: I have manufactured torches and flares continuously since 1925. I have manufactured close to a million. My duties have brought me in very intimate contact with the conditions of use of these devices in the field. I am familiar with all of the conditions of use. The testimony of Mr. Croft and the results shown on his graphs did

550 not coincide with my own experience. They were in opposition, they did not follow our own experience in that they seemed to give results which were entirely opposite from those we had obtained in our own tests and our own experience. I understood that their tests were conducted all with the air draft passing through from one flame opening and out of the other.

The wind tunnel tests that were previously mentioned in my earlier testimony were made to check the results shown by the Croft tests. And in subjecting these two torches to different conditions
551 we discovered that there was considerable difference in the amount of light offered by the Anthes torch in a 45-degree position as compared with a 90-degree position. And we checked our own torch, and we found there was also a difference in those positions with our own torch, but strangely to say, they were in the opposite direction from those of Anthes. In other words, the better flame was produced with the Anthes torch in the 90-degree position, or with the holes coincident with the direction of the air stream, and a poorer flame was produced when the torch was rotated so that those
552 holes were at 45 degrees; whereas, in our own torch, the better flame was produced in the 45-degree position as compared with that produced with the torch in the 90-degree position. I took readings of those tests with a Weston foot candle meter supplied by the Toledo Edison Company, Illuminating Engineering Department. I can give the results of the tests that I made. I have them both in detailed form and I have a summary. The detailed report reads as follows:

"LIGHT INTENSITY TEST 553

"*Object*:

"The purpose of this test was to determine relative intensity of light issued by Anthes and Toledo Economy Burners at various wind velocities and different positions of burner hoods, with respect to direction of wind stream.

"*Apparatus*:

"Experimental wind tunnel constructed by The Toledo Pressed Steel Company after design suggested by The DeVilbiss Co. (Illustrated by Plaintiff's Exhibit 31.) In place of using a variable speed motor, a series of cardboard reduction plates 554 were used to secure variations in wind velocity. These were applied to the intake end of the tunnel as shown in illustrations herewith.

"One regular Anthes truck flare, purchased from Montgomery Ward & Co. at Lima, Ohio.

"One regular No. 770 Toledo Truck Flare.

"A Model No. 614 Weston foot-candle meter borrowed from a Toledo Edison Co. illumination engineer. This instrument was part of his everyday working apparatus and was vouched for by him as being accurate and in good condition. The instrument was secured by Mr. Close in whose possession 555 it remained until it was returned.

"*Procedure*:

"The Anthes and Toledo Torches were both given a wick extension of 1/8" and were lit and allowed to burn until operating in usual manner. The tunnel was then put in operation at full intake capacity. Each torch was then placed successively on the shelf at a distance of one foot from the discharge end of the tunnel. The torch was placed so that the flame ports of the burner were at right angles to the direction of the wind stream. The

556 readings for light intensity were taken at a distance of six inches from the flame and are represented in the tabulation as an average value of the vibrating range of the needle when the meter was switched to its lowest recording position. This figure represents the average foot candles of light which were impinged upon the vertical surface of the photo electric cell element of this device.

"After observing the results in this position, the torch was rotated until the flame ports were all at 45 degrees angle to the direction of the wind stream. The readings were also taken in this
557 position.

"When readings in both positions had been made for the Anthes torch, the same procedure was followed with the Toledo Torch.

"After conducting the experiment at full intake capacity, successive experiments were made using reduction plates providing substantially 25%, 50% and 75% reduction in area of intake, and the results noted in each case. Then the entire experiment was repeated using a 3/8" wick extension.

"Through the use of a Taylor Vane Type Anemometer, supplied by the DeVilbiss Co. and oper-
558 ated by Mr. Dukes of the DeVilbiss Co., the velocity of the air at the various stages of reduction was measured and these average velocities were established as 16.3 m.p.h., 25.1 m.p.h., 26.9 m.p.h., and 28.7 m.p.h. from the greatest reduction to the open full capacity, respectively.

"This experiment was conducted in the space below the stairway in the hallway compressor room in the factory of The Toledo Pressed Steel Company and the light is supplied by a single window; illumination entering the room from this window 20 feet above the stairway above the experiment was

not enough to register on the meter at the point of the experiment so that it is not considered that this source of light had any influence on the results. 559

"The room temperature was between 65° and 70° Fah.

"Fuel used was kerosene. Sp. gr. 7995. Flash pt. 135°.

"The experiment was conducted on Jan. 28th, 1938, beginning at 2:30 P.M. and was conducted entirely by Mr. Close who both read the meter and recorded results.

"*Results*: 560

Wind Velocity m.p.h	Torch	Position of Flame Port with Respect to Direction of Wind Stream	Foot Candles at 1/8" Wick Extension	Foot Candles at 3/8" Wick Extension
28.7	Anthes	right angles	5	7
	"	45°	2½	3
	Toledo	right angles	2	2½
	"	45°	2½	5
26.9	Anthes	right angles	7	6
	"	45°	2½	3
	Toledo	right angles	3	3
	"	45°	4	5
25.1	Anthes	right angles	10	9
	"	45°	3½	4
	Toledo	right angles	2½	5
	"	45°	5	9
16.3	Anthes	right angles	18	12
	"	45°	7	5
	Toledo	right angles	7	5
	"	45°	21	13

561

"*Conclusion*:

"The results in this test show that there is a

562 difference in the brightness of the flame issuing from these torches, depending upon whether the flame ports are coincident with the air stream or at greatest possible deviation from coincidence. This experiment further demonstrates that whereas the brightness variation is opposite in these two torches, the averages, which represent more nearly the practical conditions of use, are practically coincident so that it can be considered that no substantial difference exists in the brightness of these torches at the same or comparable wind velocities in actual usage."

563

"SUMMARY"

"Total foot candles at four wind velocities (16.3, 25.1, 26.9 and 28.7 m.p.h.) with flame openings at right angles to direction of wind stream—

	1/8" wick extension	3/8" wick extension
Anthes	40	34
Toledo	14½	15½

"Same with flame openings at 45° to wind stream—

Anthes	15½	15
564 Toledo	47	47½

"Total foot candles at four wind velocities (16.3, 25.1, 26.9 and 28.7 m.p.h.) with flame openings at right angles and 45° to wind stream—

	1/8" wick extension	3/8" wick extension
Anthes	55½	49
Toledo	61½	63

	Totals
Anthes	104½
Toledo	124½/"

The Court: Upon this summary where you say 40—

The Witness: 40 foot candles right on the instrument. 565

The Witness: I have witnessed thousands of open air tests and operations of torches and flares both of the open and closed flame type.

Q154. Which would you say would be the fairer test of the efficiency of a flare, to place the flame opening always in one position with reference to the air stream, or to rotate the flare so that it would be in different positions with reference to the direction of the air stream? A. Well, obviously the rotation of the torch would subject it to different conditions, that is, you mean to place it— 566

Q155. I mean which would more closely approximate outdoor conditions where the devices are intended to be used? A. That is what I understood. Yes, rotating it would more closely approximate the outdoor conditions, because then you would get the wind currents directed, it would be equivalent to wind currents directed to the flame from different directions, which you would experience in outdoor conditions.

I heard Dr. Luckiesh testify that the average wind velocity throughout the United States at a point six inches from the ground is about one mile 567 an hour. That does not coincide with my experience. I know of no average such as that. I would say that the occasions arise so often in the operation of a torch when the velocity at the ground is so enormously greater than one mile an hour that I would have to question an average of any such small proportion as that.

I stated that I have witnessed thousands of operations of these devices in the open air. You can tell from watching them in operation, whether there is any air stirring—you can always see the

568 flame moving. I have never seen any conditions when the flame was not moving, when the torch was placed outdoors.

I would consider the proper way to test two devices for fuel consumption, if they were intended to be used in the open air for periods up to 12 hours or more, without the attention of an attendant to be to simply fill the torches and adjust them as they were supposed to be used, and recommended by the manufacturer, and light them and go away and leave them for the required length of time. I do not know of any fairer way to make
569 such a test. The differences in the size of the fuel tank should not have any material effect on the reliability of such a test.

With reference to the capillary lift there is in our torches and flares, we know they burn dry, and therefore the oil will lift the full height of the torch. I have never known one of them to fail from lack of fuel supply at the exposed end of the wick when there was fuel left in the tank and the wick was long enough to reach the fuel. After eight hours burning, the depths of fuel ordinarily left in our torch or flare would be from one-third to one-
570 half, it depends upon whether you are speaking of the flare or the torch.

Cross Examination by Mr. Wisner:

The Witness: This photograph, Exhibit 31, which has already been offered by the plaintiff, is a photograph of the wind tunnel apparatus which was used in these tests which were last introduced in evidence, about which I testified on this direct examination. In these tests for illumination, the torch which was being tested was in the position as

shown in the photograph, slightly below the center 571
of the wind tunnel, below the horizontal center. It was approximately one foot away from the end of the tunnel. If I recall correctly, the torch in the tests taken by Professor Croft was placed considerably further away from the end of the tunnel than that. The illumination readings for arriving at foot candles produced by torches in the tests that we ran were taken at different positions, at a 6-inch radius around the light. I think we averaged between five and eight readings on each position during a period of time just long enough to take the reading. You could run that whole test there in 572
less than an hour. That is, all the data which appears here was secured in less than one hour. I made no observations of fuel consumption during this time. The performance results which I obtained between the Anthes and the Toledo were opposite to each other, but of similar quality, in the opposite direction.

XQ178. Now in the rotation of this torch on a table before a wind tunnel, have you ever observed in actual practice, wind swinging through an arc of 360 degrees within a minute, or four times a minute? A. A good many times, yes. 573

When I testified with reference to the velocities of wind which I have observed within a foot of the ground, that is without any basis of measurement except the fact that I saw objects which would obviously require considerable wind pressure to move them, being lifted completely off the ground. Not necessarily in a hurricane but we certainly have gale velocities in ordinary weather. I have seen pieces of paper and dirt occasionally lifted up from the ground.

XQ182. When a substance is lifted from the

574 ground, ordinarily it has a large surface area? A. I was just mentioning dirt and gravel and small particles.

I am not familiar with the results obtained by the United States Department of Agriculture at their evaporation stations.

In the foot candle meter readings which were taken at various positions around the circumference of the circle an attempt was made to get as wide a variation as possible. Some readings were taken at one point of the arc of the circle and some at another, but no definite space between except we
575 duplicated them in the two torches. Whatever we did for one torch we did for the other. And we took these candle readings at 6 inches and the meter readings in foot candles. There are three scales on that meter. That is No. 604, I believe. I made no adjustment for the 6-inch. I took readings given by the low scale at 6 inches, and those readings represent that. I do not know that the instrument we used was such that we could set it at 6 inches and obtain foot candle readings, but I know the figures represent the foot candle readings on both of them.

576

JOHN C. OLSEN, called as a witness in rebuttal, in behalf of plaintiff, being first duly sworn, testified as follows:

Direct Examination by Mr. Darby:

Q1. Will you please state your age, residence and occupation? A. I am 68 years old. I reside at 3116 Argyle Road, Brooklyn, New York.

Q2. With whom are you associated? A. I am a professor of chemical engineering at Polytechnic

Institute, Brooklyn, and a consulting chemical engineer. 577

Q3. Will you state very briefly your education, training and experience, which would qualify you to testify as an expert in a case involving the combustion of fuels for the purposes of lighting? A. I received my education at Knox College, and my university training at Chicago University and Johns Hopkins University, receiving the degree of Ph.D. or Doctor of Philosophy at Johns Hopkins University. I have been employed at Polytechnic Institute since 1900, with a short period of four years at Cooper Union, head of the department 578 and professor of chemistry.

I have been a consulting chemical engineer and have studied and testified in a good many cases on combustion and explosion of various fuels, such as gasoline and other combustible liquids.

In connection with my work it has been necessary to make a study of various fuels and their combustions, and burners or other methods of burning the fuels, the air supply, the amount of fuel and the amount of air necessary for combustion, and the nature and character of the fuels, their manufacture and their use. 579

Q4. And in preparation for your testimony in this case, were you handed a flare or a torch of the plaintiff's Economy burner, and the Anthes structure, here charged to be an infringement? A. Why, I purchased the flares that I used, getting three of the Anthes flares and three of the Toledo flares from the companies that sell these, namely, Montgomery Ward and Sears Roebuck Company, who have stores in this area, and I used these which I purchased for the tests that I carried out.

Q5. And were you informed these flares would

580 withstand weather conditions, including wind and gale velocities, without being blown out or rained out? A. Yes, when Mr. Withrow told me about this case, he said they had a flare and there was also a competing flare which he said would not blow out at 40 miles an hour or higher.

Q6. And how did that check with your knowledge and experience, based on your experience with the use of fuels for light purposes? A. All ordinary lamps and flames that I have been familiar with could be easily blown out, except possibly lanterns which were especially designed for that pur-
581 pose, and I was very much surprised when he told me that he had a open flare, in other words, an open flame that would keep burning at a 40 mile an hour wind, and I was very much interested to know what this device was and how it was constructed and operated, so that it would not be blown out at that wind velocity.

Q7. And what do you understand to be gale velocity as defined in Webster's dictionary? A. It may run up to 65 miles an hour or possibly more, and they call it a gale when it is considerably less than 40 miles an hour. It is a very strong wind, and
582 exerts a great deal of pressure, and, of course, 40 miles an hour is a very high velocity, and flames, of course, are gases, that is combustible gases mixed with air, and, naturally, with such a high wind velocity, you would imagine that it would carry the whole business away.

Q8. Now, do you accept Webster's dictionary's definition as a gale being between 25 and 75 miles an hour? A. Yes.

Q9. And did you make a scientific study of these burners to determine what enabled them to withstand gale velocity without being blown out? A.

Yes. That is the first thing I started out with. I 583
said to myself, the only way I can understand this situation is to try and find out what it is in this structure that enables it to withstand that wind velocity when ordinary flames go out so easily. I had to take into consideration in that respect the nature of the fuel, because I realized that it would make a difference as to what fuel you were using, and we have three common fuels used in flames, they were manufactured or natural gas, which is already in the gaseous form, and gasoline, which is used in internal combustion engines, and we have kerosene.

Now, these three fuels are very, very different 584
from the standpoint of the burner, either for light or heat. The gas is already in the gaseous form, and therefore nothing is required to convert it into the form in which it should burn; and all flames are produced by the combustion of a gas. So that if you are going to burn kerosene or burn gasoline you have to convert it to vapor form, otherwise you cannot get a flame.

Now, gasoline very readily volatilizes, in fact, it will cause such combustible vapors 'way down to zero Fahrenheit, so that you can use it in internal combustion engines and start your engine in cold 585
weather.

Kerosene, on the other hand, gives off no combustible vapors at ordinary temperatures; in fact, you have to heat it quite a lot before you can get sufficient vapor to give what we call a flash. You can throw a match in liquid kerosene, and nothing will happen, it won't burn, it cannot burn as a liquid. And you cannot burn it on a cold metal surface or anything outside where there is no heat. It simply cannot be done. The only way you can

586 burn kerosene, therefore, is to have some device by which it is vaporized.

Now, the form which has been used for centuries, or the method which has been used for centuries, is the use of a wick, and by using a wick you have a small amount of fuel which can be heated with a match or other source of ignition, and you get a very small amount converted to vapor. This produces a flame, and the heat produced by that flame will then heat the rest of the wick with the kerosene on it and convert that into vapor, and then you have the flame going all the
587 way around arising from the vapor. If you in any way prevent this process of vaporization of the fuel your flame will go out, because you haven't got the necessary vapor to feed the flame.

Now, in studying this device, I considered the fact that even in a high wind, that the kerosene must be heated up to the flash point, as we call it, which is as low as 135° Fahrenheit, and it varies somewhat with commercial kerosenes, but it will run up to 150 or 160 degrees Fahrenheit, which is a relatively high temperature. In other words, you have got to heat the fuel to that temperature, and
588 maintain it there in order to have it burn.

Now, I found that this device had a little chamber, I call it a combustion chamber, in the bottom of the cap, and that this is protected, and there are some air holes which are restricted, not too big, so that when you once light it you have a little chamber where a little air is admitted, and which maintains the temperature of the wick to the point where it will give off vapor.

I tested that apparatus by burning it for five or ten minutes, and then I used a thermometer to test the temperature of the kerosene, which is fed up

through the wick, and I found that that temperature was well above the flash point, it ran up in some tests as high as 210 degrees Fahrenheit, which is way above the proper temperature, and I think the lowest point I got was something like 153 degrees. And this temperature was reached even in a 40-mile wind. In other words, high wind velocity did not seem to succeed in eliminating this little flame, or cooling the kerosene, whether it be the Anthes or the Toledo; they both acted alike in that respect, they both gave us this high temperature of feed. 589

Now, above this little combustion zone is an imperforate cap which, of course, would serve to keep water off the wick. If water soaks the wick, naturally it would vaporize and cool the wick down below the temperature at which the oil would burn, and the flame would go out. So that covered the matter of water, and this wick also got hot— 590

Q10. The wick? A. The cap also was heated, yes, the cap. I determined the temperature of the cap, and I found the temperature of the cap would run up over 200 degrees Fahrenheit, and even a little higher. I think I got figures as high as two or three hundred degrees. 591

Now, this cap being of metal, and being maintained at these temperatures by the flame, would conduct the heat into the flange and into the tube surrounding the wick, and this heat would supplement the heat from the small flame in the combustion zone, and would succeed in maintaining the temperature of the wick and the wick tube and the kerosene, so that you had a constant feed of kerosene which would be vaporized and keep that flame going.

And when I reached that conclusion after these

592 experiments, I thought I understood how this device operated.

Q11. Did you determine whether or not there was any difference in operation, or reason for difference in operation between the plaintiff's structure and the defendant's structure? A. I examined these two structures, and I found that they each had the same essential parts, they each had a cap with a flame opening, and this cap was connected with the flange which was connected with the wick tube, so that I could see in each case the heat would be transmitted into the wick tube.

593 Each of these two instruments also had restricted air openings into this combustion zone which I have designated, and therefore it would keep this little flame operating.

When I tried these two flares out, I found that they operated under ordinary conditions, that is, without much wind velocity, similarly. And I subjected the two of them to varying wind velocities, and I determined the fuel consumption, I determined the temperature of the kerosene in the wick, and I determined the luminosity of each of these flames. And I used three of each so as to

594 overcome any individual differences. And when I got through and averaged up, they were just about as alike as two twins, or two peas in a pod. There were little differences, but I thought they were insignificant.

My conclusion was after these tests that they acted identically so far as reasonable allowances for slight variations would hold. I could get just as big a variation between three different samples of the Anthes flare and from three different samples of the Toledo flare as I could between any two of them. The variations were well within the

limits of manufacture and use of these devices. 595

Q12. To be a little bit more specific, did you find any difference in principle of operation between the Anthes flare and the Toledo flare, difference in principle of operation. A. No, they both had all the essential parts; neither of them was missing in any essential feature. Whatever differences there were in construction, such as the air openings at the side and at the bottom, didn't seem to make any difference in the operation of these. In each case there was enough air admitted to maintain this flame in the combustion zone which, to my way of thinking, is the actual, the essential 596
part of this device, or at least a very essential part, that they do maintain that flame and under high wind conditions, so I couldn't see any essential difference between them.

Q13. Did you find it made any difference whether the air was admitted from the side of the cap or from the bottom of the cap in maintaining that air in the combustion zone? A. It was maintained equally well in each place, and it heated the kerosene equally. I think I got a little higher temperature of kerosene with the Anthes, I think I got a temperature of 210 with the Anthes and with the 597
Toledo I got 201. But I did not consider that difference of 9 degrees anything essential, because they were both so far above the flash point that for practical purposes it was the same thing.

Q14. Did you hear the testimony of Dr. Luckiesh? A. I did.

Q15. To the effect that by putting the air intake holes in Anthes at the bottom of the metal cap, as distinguished from at the side of the metal cap, that an entirely different principle of operation was involved? A. Not that I could see; I couldn't—

598 Q16. My first question is, did you hear Dr. Luckiesh's testimony? A. Yes, I did.

Q17. Do you agree with that? A. I do not agree there is a difference in principle or difference in operation, no.

Q18. Have you made yourself familiar with the instances of the prior published art which have been cited in this case? A. I have.

The Court: I think we can confine ourselves, so far as the patents are concerned, to three patents.

Mr. Darby: I am going to, your Honor.

599 The Court: You agree to that, do you not?

Mr. Wisner: As anticipations, you mean?

The Witness: Anticipations.

The Court: Will you name them?

Mr. Wisner: Rutz, Malcov, Argand and Salsbury.

Mr. Darby: Then there are four of them.

The Witness: You have got Rutz here.

Mr. Darby: Rutz, Malcov, Argand and Salsbury. I do not find Argand—

Mr. Wisner: Argand is a description.

Mr. Darby: I can ignore Argand then?

600 Mr. Wisner: No, no.

Mr. Darby: Argand and Salsbury; there are four. If your Honor will permit, I will ask one blanket question that will take care of the remainder as well as those four.

The Court: All right.

Q19. Will any structure of the prior art as established by the patents and publications, all of the patents and publications set up, accomplish the same result, in your opinion, as is accomplished by the Anthes and Withrow flares? A. No, I do not

think there is any device of the prior art that accomplishes what these two do. 601

Q20. In the first place, let me ask you this, Doctor: Do you consider a gas burner, gas stove burner of Rutz, to be an art analogous to a kerosene wick burner? A. Why, no, because in using gas you already have it in the vapor state, and you also have it under pressure. You need have no worry in that case that your fuel supply is gone. There is no provision therefore—you need to have no wick, you need to have no heating of your kerosene, and you need to have no provisions of that sort. In the gas burner you already have your 602 fuel coming in the vapor state through the pipe and out of your little jet here, and unless the wind blows it out, why, that jet will keep burning.

Q21. Let me ask you this, Doctor, is the gas burner type of Rutz deliberately designed so as to avoid heating the cap or any part of it. A. Yes, that is what Rutz says, that he did not wish the cap to be heated. He did not desire the cap to be heated, and he took every means to prevent it from being heated. In his case it was undesirable. In the case of these other burners it is quite helpful, to say the least, if the cap keeps hot, because it 603 does help to heat the fuel and keep the flame going.

The Court: What prevents it in Rutz?

The Witness: He placed it centrally so that it would not heat the sides, or he did not want it to heat the sides, which it might do if it was placed over on one side. Then his pilot-light is very small, in the first place, and when his fuel actually does burn the pressure of the gas will thrown the flame out of this opening, that is what throws the flame out—

604 The Court: What is the number there?

The Witness: Out of the opening 12. This is the opening through which the gas jet is to go. And he has sufficient pressure in his gas to eject the gas in a stream out of that opening, and then it burns outside of the opening and is subjected, of course, to any air currents which you may have. We have no such pressure up here at all; any pressure we have here comes merely—

Q22. Referring here to Fig. 1 of Exhibit B? A. In this Exhibit B we have no pressure at all, and
605 this flame gets out of here either by wind currents or by the evolution of gas down here, or the draft of air which comes here and carries it out. It is a different construction, and operating with a different fuel and different conditions, therefore it must be designed differently. You must design your burner for your fuel. They must go together, and the man designing a burner for gas has a very different condition from designing a burner for a liquid fuel like kerosene, whether it is to be a lamp or a burner to produce steam and heat the house.

The Court: If you put a kerosene oil burner

The Witness: If you put a kerosene burner in here there is no assurance that you will have
606 in there, would it be efficient?
here, that you have the proper openings for your flame to go out, or whether your air supply down here is proper and right. This air supply here must be just such as to keep this burning here. Here there is no such necessity. These openings may be too litle or they may be too big. The size of this may not be just right; this cap may be out of line with it, and therefore you might just as well start afresh

in designing this thing; you would probably 607
do better if you did and forgot that thing.

Q23. I would like to get it clearly on the record just what the Rutz patent teaches as to its operation. If I correctly understand it, gas under pressure, illuminating gas under pressure, is fed through the pipe line numbered 4, is that correct? A. Yes.

Q24. And that gas burns in the form of a very small, little blue flame at the tip of that tube, is that right, the tip 9? A. They usually have a little separate line—

Q25. I mean as shown in the patent. A. As 608
shown in the patent, yes.

Q26. As shown in the patent there is a small flame there? A. There is a little opening there for it, in fact.

Q27. That flame does not impinge thus far against any part of the structure, does it? A. No, sir.

Q28. At the very tip 9 there are what appear to be outlet ports; you understand there are four of those altogether? A. Yes.

Q29. And directly in line with each of those four outlet ports is a larger outlet port numbered 609
8', and there are four of those, is that right? A. Yes, sir.

Q30. And when you operate this device you press a button or something of the sort on the stove which increases the gas pressure, and four jets of flame extend from the tip 9, is that right? A. That is right.

Q31. And still those jets do not contact with the— A. No, sir.

Q31. (continuing)—with the cap, is that right? A. That is right.

610 Q32. And the tip 9 is closed at the top, so that there is no flame directed upwardly, is that right? A. No, sir; there shouldn't be any flame directed upwardly.

Q33. With that understanding of the operation of this device, I direct your attention to the language of the Rutz patent, which Dr. Luckiesh had a little difficulty in understanding; namely, "It is also essential to perfect combustion that this torch head tip, 9', which burns a constant pilot flame, should be spaced at a distance equal in all directions from the walls and dome of the hood to pre-
611 vent generation of foul gases through the heating of said hood."

Will you state whether or not that teaches you to heat the hood for a useful purpose? It does or does not teach you to heat the hood? A. No, he is looking out for foul gases, and if his flame comes in contact with this hood it would heat the hood and cool the gas, and there would be partial combustion or incomplete combustion, and you would get certain foul gases.

Q34. Is he teaching you not to heat the hood so as to avoid the foul gases? A. Yes, and still fur-
612 ther, his problem is so totally different from this problem it would not teach you anything about it, because up here you aren't worrying about foul gases because this is an outdoor affair, and you do not care whether there are foul gases or not.

Q35. Will you please give us your opinion as to whether or not with full knowledge of the Rutz patent and its disclosure, would it give any helpful information to one seeking to produce an open air enclosed flame torch that would withstand wind velocities of gale proportions? A. No, I can't see that it would.

Q36. There is another phase of this Rutz patent. 613
First let me ask you this, does the patent point out the purpose of the bottom holes 6 and 7 in the Rutz patent? A. I think he says he gets a column of air going up each side, as I remember it.

Q37. He gets a column of air going up for what purpose? A. I believe he thinks that helps to protect his flame from being blown out.

Q38. In other words, he would put a complete cylinder of air around his flame? A. Yes.

Q39. Which is a small pilot? A. Yes.

Q40. And what velocity of wind, in your opinion, would be protected sufficiently by a column of air 614
of that kind? A. That depends on the velocity of that air current going up, which naturally wouldn't be very high, and naturally would not protect a flame agains any high wind velocity outside. He is protecting his flame against modest gusts of wind that might occur in a kitchen either by movement of articles or the opening of a door, such as you would call a draft of air. For that purpose his column of air probably is of some value. But if you took that out in a high wind I don't think it would amount to anything, it seems to me.

Q41. All right, let us take up this Russian 615
patent, Fig. 4 of Defendant's Exhibit B. Do you agree with Dr. Luckiesh—

The Court: That is the Malcov patent?

Mr. Darby: Yes, the Malcov patent, Fig. 4, Exhibit B.

Q41. (continuing)—Do you agree with Dr. Luckiesh that the disclosure of this patent is ambiguous and vague? A. Oh, yes, I spent a lot of time on that trying to figure it out.

Q42. Have you yet figured out what the structure was? A. I am not certain we have got it

616 figured out, but I think this is probably a close approximation to it. Whether it is right or not, whether there are four members supporting this or two, is a question. It seems to me there are only two, and I think in the model he has got four. I think his description indicates only two. Other than that he did have a perforated top and a couple of wings, shown here. (Indicating.)

Q43. And when you refer to the model, you mean Defendant's Exhibit I? A. Yes.

Q44. Now, will you state specifically with reference to the Malcov structure whether or not in your
617 opinion it could accomplish the results of either the plaintiff's or the defendant's flare structure, and state your reasons. A. The great weakness of this design, if you are going to take it out in the wind, is it is entirely open. In other words, his flame is entirely unprotected, there is no protecting cylinder, as there is here in the Anthes flare or as shown in the Withrow patent. In other words, your wind would sweep right through, with no protection and probably a very low wind velocity would blow that out.

He, of course, has a top to it through which, ac-
618 cording to the illustration of the patent, the flame comes. And if the flames come through these openings, they will have to be much larger openings than what we call pinholes, because a flame will not go through a small opening.

Q45. Now, if these openings at the top would be large enough to allow the flames through, would they allow rains through? A. Yes, I think that in rain it would get soaked nicely. It would blow in at the sides. The sides are entirely open to any gusts of wind containing drops of water. I don't

think it would be of any use at all as an open out door torch. 619

Q46. Well, do you agree or disagree with the testimony of defendant's expert that there is not any novelty in principle or operation of the flare of the Withrow structure over these prior art structures? A. No, I do not agree at all with him there. I think it is a totally new idea that has never been utilized. I do not know of any prior art burner that has been constructed on the principles of these two torches, and I don't know of any other prior torch or burner that has ever been devised that would resist the wind velocity that 620 these two will resist.

Q47. Now, will you please tell us about this Argand patent? A. The Argand patent merely discloses or describes what we call primary air and secondary air. In other words, he quite correctly says if you have trouble with the flame smoking you have not enough air and if you introduce a little more air, you will give a more complete combustion and then he has air around his flame Then he speaks of the chimney or pipe which, of course, helps to hold in the heat and prevents mild air currents from interfering with it, so his prin- 621 ciple I will agree with, but there is no structure described, and it is well known in the art that you can produce even a colorless flame, if you produce enough primary air, and if you want the flame for light, which does not smoke, you introduce it in small amounts. You may not introduce too much with your flame. In fact, we could take the Argand principle and make a heating flame out of it quite readily by the amount of air we introduce as primary air.

Q48. Now, referring to the Salsbury patent of

622 1895, No. 16,524, would that structure perform the function and serve the purpose of either the plaintiff's or the defendant's flare? A. This structure, which is commonly placed over flames used for light which assists in carrying out, I might say, the principle of Argand so as to get a little more complete combustion and a little better flame. He has some air openings for his primary air, but his flame is not protected against wind or rain so that I would not consider that that would be helpful.

Q49. Will you compare the disclosure of the Salsbury patent with Plaintiff's Exhibit 39 and
623 Exhibit 37, which were evolved by Mr. Currie in his unsuccessful efforts to solve this problem? State how in principle of operation the Salsbury patent differs from those structures, if at all. A. Well, in the Salsbury patent he introduces air through two devices, that is his Ring B and then in his little hood he has openings all around. In this device he is limited very much to just a few openings here around the flame (indicating), and has this cup for the flame to burn in. But this is altogether too exposed to stand high wind velocities. In this device he has changed the shape of the lamp, mak-
624 ing a difference, it probably would. Now, in the Salsbury device he is producing a flame for illumination probably which would be of a different form from this (indicating). He has departed quite a good deal in this device here from what he has in there (indicating).

Mr. Wisher: By "this device," you are referring to what exhibit?

Mr. Darby: Exhibit 37.

Q50. Did you participate in the tests that Mr. Close last testified concerning, on the stand? A. Yes. He was at the Polytechnic Institute when we

made some tests in the wind tunnel at velocities 625
from 20 to 30 miles an hour on the Anthes and Toledo torch. We turned the burners in the 90-degree position that has been described, and the 45-degree position, and we took the luminosity at 6 inches away from the flame and I averaged up all these results. In other words, for a given flare I would take the mean or the average of the figures at 90 and 45 degrees, and then I would just take the average of the luminosity at the three wind velocities. I did the same thing with the other flare, and when I came to my final total average, they were practically identical. They 626
were so close together that you would not know which was which. In other words, between 20 and 30 miles an hour, and measuring light at 90 degrees and 45 degrees on the two flares, their luminosity was identical.

Q51. Dr. Olsen, in comparing the fuel consumption of two open wick burners of any type, and regardless of the purpose for which it is used, does it make any difference what the size or shape of the container for the fuel may be? A. Not for making a test, but the container must have enough fuel to burn for overnight, in other words, 12 or 14 627
or 16 hours. If you burn a whole lot of fuel you must have a big receptacle. Outside of that you can test them for comparative purposes by putting them under identical conditions and weighing before and after.

Q52. In determining the relative efficiency of an enclosed flame and an unenclosed flame burner, first, in your opinion, tell us is it a fair test to take a burner designed for a closed flame operation and merely remove its cap and compare its efficiency in the two conditions without change. A. I would

628 have to find out that each functions properly under the conditions to be tested. In other words, I would have to first find out whether the open flame will keep burning, and if it does not, then it is not worth anything in my opinion.

Q53. My question is directed to this: Is there a difference in structure in a device which is designed for open flame work? A. Absolutely.

Q54. As compared to a device that is designed for enclosed flame work? A. Of course. You can use a much smaller flame in a closed structure. If it is going to be an open flame, you may have to
629 make many modifications and changes in order to have it operate properly.

Q55. Did you hear the testimony of Dr. Luckiesh that the average wind velocity of the United States at one foot from the ground is 2 miles an hour and 6 inches from the ground is 1 mile an hour? A. I heard that.

Q56. Do you agree with that? A. I have no means of disagreeing. Maybe he is right. But what of it? I have never tested the average wind velocity. I don't think I have any interest in knowing it.

630 Q57. Let us confine ourselves to locality in this vicinity with which you are familiar. Would you say that statement would be correctly applied to parts of New York? A. Once more, I don't know whether it is or not. I know that we have high wind velocities and low wind velocities. Sometimes it almost takes you off your feet and raises dust and dirt, and clearly we must have very high wind velocities at the surface. What the average is I am in total and complete ignorance. I am not competent to testify on that point.

Mr. Darby: You may inquire.

The Court (to the witness): Have you had an opportunity to examine Defendant's Exhibit L? 631

The Witness: Yes. I did look at that. Well, I cannot tell, but I assume that there are openings underneath. That I don't know.

The Court: Now does it or does it not follow the teachings of Rutz?

The Witness: No. I don't think so, Your Honor, because you see he has taken the cap off Rutz and put it on the bottom of another device which was designed to burn kerosene. He has taken part of Rutz and part of somebody else and stuck them together. 632

The Court: In what respect doesn't it follow Rutz?

The Witness: The cap, I suppose, may have been constructed according to Rutz. So far as this goes, when he puts this on (indicating) he had these openings and this here (indicating). In other words, his intake is there (indicating), and he has little openings here which will carry the air in (indicating). I don't know whether flame would come out. I doubt that it is big enough. 633

Mr. Wisner: The cap is removable, Your Honor.

The Witness: Yes. Now, whether that has got enough air, that is another question. Whether those air inlets are what they should be, that is another question. If he merely copied Rutz, the chances are it would not be right. He would still have to modify this thing. The openings here (indicating) and here (indicating) would be more than he ought to have, and as to whether this is big enough or large enough, that is another question.

634 You still would have to take that thing and proceed to experiment with it to find out whether he had a satisfactory flame, and I should judge from looking at it that it would not have a satisfactory flame, to any commercial device. You can't take a commercial device and take one little thing and have it o. k. You must have it all o. k. It must be carefully designed and made just so.

The Court: What I am trying to get at is if you put kerosene light in Rutz, will it work as a torch?

The Witness: In so far as he has done that,
635 it would. What he has done here is take part of the structure and put the two together, he may have done so. If you give me $10 and I get $10 from him, that is $20.

Mr. Darby: I will try to clear it up by some specific questions, Your Honor.

The Court: Very well.

By Mr. Darby:

Q58. Let me put it this way: In the first place, Dr. Olsen, in the structure, Defendant's Exhibit L, is the cap heated when the device is in operation?

The Court: Do you mean in a gas stove?

636 Q59. In Exhibit L. A. I judge it would be.

Q60. It would have to be, wouldn't it? A. Yes, in order to function.

Q61. When it is heated does its heat serve the purpose of keeping the kerosene above the flash point? A. Yes.

Q62. Now, is there any teaching in the Rutz patent to that effect? A. No, there is no necessity of heating.

Q63. Is the teaching in Rutz diametrically opposed to that? A. Yes.

The Court: I do not think any question exists but that Rutz was intended for lighting gas jets and not for lighting purposes. The only question is are the two far apart or not? Are the two arts far apart or not? That would be for argument later on, of course. 637

Mr. Darby: We have gone as far as we can on that, Your Honor.

The Court: Take Rutz and assume it would work as a torch—

Mr. Wisner: I think that one of the very important things we have to decide here is whether a transfer of this device to a flare is something that becomes an invention or not. I think that is an important question in this case. 638

Mr. Darby: All we can do is to bring to bear as much evidence as we can to be of aid to the court. To a man skilled in the art, does that amount to an invention? And we have gone as far as we can, we have produced the inventor who was trying for two years to develop something like that.

Cross Examination by Mr. Wisner:

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XQ64. The first time you ever had any experience with one of the devices such as exemplified by Plaintiff's Exhibit 19 was when Mr. Withrow came and talked to you recently? A. Yes.

XQ65. Before that you had never done any work with kerosene open flame torches? A. No, not an open flame torch.

The Court: How long ago?

The Witness: He came about February the 10th, or something like that.

XQ66. Less than a month ago? A. Yes.

640 XQ67. And all of your experiments and knowledge that you have with reference to these devices in the prior art have been acquired since February the 10th? A. Right, except, of course, my general knowledge of combustion and flames.

XQ68. Now, will you explain the nature of the tests to which you subjected the devices? A. What do you want me to start with?

XQ69. You tested for 40 mile an hour winds, I believe? A. I think there was three series of tests that I carried out. If you wish me to give you those in order, I will do it.

641 XQ70. Did you make any memorandum of the results of the tests? A. Of course.

XQ71. And have you those memoranda? A. I have a copy of the reports with all the figures and everything else.

XQ73. Now, when you were subjecting these two devices to a 40 mile an hour wind, what color was the flame? Did you observe that? A. As the wind velocity increased, the flame became bluer.

XQ74. And it was quite blue at 40 miles an hour? A. Yes.

XQ75. Did you make any measurements of its
642 candle power at that stage? A. Yes.

XQ76. And what were the results of your candle power measurements? A. You asked 40 miles?

XQ77. Yes. A. I did not make any at 40 miles.

XQ78. In wind tunnel tests at 40 miles an hour, how far did you place the burner cap from the end of the wind tunnel? A. I said I made tests at 30 miles an hour.

XQ79. I understood you to say on direct examination that your tests were made at 40 miles an hour? A. I might have tested them to see if they would burn at 40 miles an hour.

XQ80. Did you? A. Yes. 643

XQ81. And did they burn at 40 miles an hour? A. They did.

XQ82. With what kind of a flame? A. With a bluish flame, I should say.

XQ83. And what is the temperature of a blue flame? A. The maximum temperature of a blue flame with gas is 1735 degrees Centigrade. I have melted a fine platinum wire in the tip of a Bunson burner blue flame, and the melting point of platinum is given as 1735 degrees Centigrade.

XQ84. And this is the same type of flame that you found in this torch at 30 miles an hour? A. 644 Yes.

XQ85. A blue flame? A. Yes.

XQ86. Having approximately that temperature—that is, you can tell a flame temperature roughly by its color? A. I would not want to say definitely.

XQ87. Well, approximately? A. It might have been 100 degrees or so off.

XQ88. Well, plus or minus 100 degrees, it was 1700 degrees temperature then? A. Well, you are asking me to make an estimate of a flame, a kerosene flame at 40 miles an hour. Now, that is something of a guess. I never tested the temperature 645 of that flame.

XQ89. Did it occur to you? A. Why should I?

XQ90. You were not asked to test that? A. I saw no reason to test it.

XQ91. Now, down to 30 miles an hour velocity, what sort of a flame had you there? A. It was bluish in character, some blue, some white.

XQ92. Did you make any measurements of the temperature of that flame? A. No.

XQ93. Did it occur to you that it might be some-

646 thing that would have some bearing on the operation of the device? A. No.

XQ94. And from what source does the heating of these two caps about which you have testified, come about? A. From the flame.

XQ95. And suppose we remove the caps entirely from the structure of this type. The flame still has a high temperature, does it not? A. It would probably blow out.

XQ96. I asked you what its temperature was. A. I could not give the temperature if the flame is gone.

647 XQ97. I said in an open flame, from a wick, what temperature has that flame? A. That depends on what you mean by open flame. I don't know what you are talking about.

XQ98. Take one of these torches and take off the flame guard, light it and you get a flame, don't you? A. Yes.

XQ99. And in circumstances of that kind, what is it which vaporizes fuel? A. The heat of the flame.

XQ100. And what is the temperature of that flame, assuming that we are in still air? A. It is

648 quite a little below the temperature that I have given for a blue flame. It is probably two or three hundred degrees below.

XQ101. And much hotter than any observation you made on the metal caps? A. Oh, yes.

XQ102. You measured those temperatures? A. Yes.

XQ103. I believe the metal cap in certain instances was as much as 200 or 300 degrees? A. I can give you that exactly, if you want it.

XQ104. Please do. A. Well, the highest tem-

perature of the cap that I obtained was 718 de- 649
grees Fahrenheit.

XQ105. And whose torch was that? A. That is on the Anthes torch.

XQ106. And what was the wick extension that we used then? A. I think it was 1/8th of an inch.

XQ107. And what were the air conditions? A. None. That is, there was no wind, still air.

XQ108. And where was that measurement taken, from what portion of the cap? A. The entire cap. I will tell you just what I did. I quickly removed the cap and immersed it in water, with a ther-
mometer, so as to know the temperature, and then 650
I noted the temperature of the water when it reached maximum, and then I calculated the temperature of the cap which would be the average temperature of the whole metal of the cap.

XQ109. But whether or not there was a cap, there would be a heat beating down from the flame onto the top of the wick, would there not—any condition of any type of burner or structure? A. There is a certain heating of the flame, but about the heat beating down on it—I don't agree with that.

XQ110. Well, where does the heat come from in 651
an open flame torch, without any cap, which keeps kerosene vaporizing? A. There is a flame immediately around the cap. That is where the flame starts.

XQ111. I am talking about without a cap. A. There is a flame immediately around the wick that is burning, and that is in rather close contact with the wick, and that flame heats the wick. Now, the rest of the flame which is above the wick has very little to do with heating the wick.

652 XQ112. You are familiar, of course, with the old kerosene lamp? A. Yes.

XQ113. With a chimney? A. Yes.

XQ114. And the wick is usually a flat one? A. sometimes flat, sometimes round.

XQ115. Well, we are talking now about a flat one—trimmed down very closely to the wick, wasn't it? A. Yes. You could regulate it for light by moving it up or down.

XQ116. And between the top of that wick and the beginning of the visible flame there is a space? A. There is a little zone there that burns blue.

653 XQ117. And that is a gas space? A. On the outside it is combustion.

XQ118. There is a space in which the vapors of kerosene heated by the flame in there are intermixed with air and without that co-operation between the air and the kerosene vapors, there can be no flame? A. Inside of the flame you will have no combustion, but you will always have a combustion zone on the outside where the air immediately comes in. It may be rather narrow, but it is there.

XQ119. Between the wick and the flame? A. On the outside of the flame.

654 XQ120. On the outside of the flame? A. Yes.

XQ121. And is it burning directly from the wick? A. Right over the wick there are unburned gases. You can put a tube in there and draw off unburned gases on the inside of the flame, but on the outside of the flame you have a narrow zone of combustion which is blue and further up in the flame you get the color.

XQ122. I believe you said the blue was hotter than yellow? A. Ordinarily.

XQ123. So that portion closer to the wick is a little bit hotter than the portion somewhat removed from the wick? A. I should judge so.

XQ124. In what path does radiant-energy travel? 655
A. In a straight line.

XQ125. So radiant energy is developed in all directions from that flame? A. Yes.

XQ126. And the shortest path to travel from the top of the wick, in radiation of the flame is downward? A. You would have radiation, of course, from all parts of the wick.

XQ127. The art is replete with examples of air chambers for mixing the air with the fuel vapors; they have been known ever since Argand first pointed out their pertinency, have they not? A. Yes, most burners have something of that sort. 656

XQ128. So there is nothing new in such a chamber to mix the oxygen and fuel from the kerosene, or whatever the fuel may be, the vapors from the kerosene? A. That particular fact is well known, yes.

XQ129. Now, to go back to this 40 mile an hour wind velocity, Doctor. Will you take the wand and point out on Fig. 1 of Defendant's Exhibit B through what orifice or opening that wind was blowing? A. You mean this figure here?

XQ130. Yes, Fig. 1 of Exhibit B. A. You would, of course, have the wind pressure on all of these 657
openings that are exposed to the wind.

XQ131. It would be roughly equal up the entire side of all the cap? A. The wind pressure would be the same all around it.

XQ132. And the wind would be coming in the flame openings more than in the air openings, would it not? A. They are larger, of course more would go through.

XQ133. Was there any metering of air in the device under such conditions? A. No.

XQ134. I understood you to say that one of the

658 important features of this device was to measure the air so that exactly the right amount was mixed with the fuel. A. No, I didn't say that; you misunderstood me.

XQ135. It has no such function as that? A. Well, the size of these openings is designed to control the burning conditions.

XQ136. At what air velocity? A. Well, at the air velocity it is to function.

XQ137. At whatever air velocity it may meet, whether it be 40 miles an hour or zero? A. Yes, that is one of the difficulties of the design. You
659 have got to make a design that will function under all air velocities up to 40 miles. That is one of the remarkable things about this.

XQ138. At 40 miles an hour a tremendous amount of air is pouring in through what formerly was the flame opening, certainly a great deal more air was pouring in through the flame opening than through the air inlet? A. Of course, it is larger, and it is unrestricted, so naturally you will have wind going through here, and of course the flame is blown out on the other side.

XQ139. Also cut through the opposite air ports?
660 A. Of course it is, so that your flame by the air velocity is carried outside beyond the burner, and of course it is very much shortened because you are mixing the gas with the air, so it is burning and burning well, you see.

XQ140. Did you observe the operation of the Withrow structure, Fig. 1 of Exhibit B, in still air? A. Oh, yes.

XQ141. Did you make any measurements of its candle power? A. I think I did.

XQ142. What was the result of that measurement? A. No, I have no measurements of that;

I have measurements from 20 to 30 miles an hour. 661

XQ143. Only in that range? A. I have them in that range, yes, sir.

XQ144. Did you make any observations of the Anthes device in still air? A. No, no, I also took that from 20 to 30 miles.

XQ145. You only observed that during the range of from 20 to 30 miles an hour? A. Yes; I had the two at 20 to 30 miles.

XQ146. Do you remember, Doctor, Dr. Luckiesh's testimony with reference to how much light that Withrow device produced in still air? A. I remember he gave it very low. 662

XQ147. You made no observation, however, of that, did you? A. No.

XQ148. Would you say that Dr. Luckiesh was wrong? A. From my work, from looking at it, I would say he was pretty low.

XQ149. You were seeking to measure it with your eye? A. Just observed it; it didn't seem to me it was anything like as low as he said, but that was just an observation, you understand; I didn't measure it.

XQ150. You notice, of course, some structural difference between the Anthes structure, Fig. 2, 663 and the Withrow structure, Fig. 1 of Exhibit B? A. Why, there are some slight differences, yes.

XQ151. The Anthes structure is mounted on a wick tube, is it not? A. Yes.

XQ152. At a 40-mile-an-hour breeze, that breeze is blowing by the wick tube, is it not. A. Undoubtedly.

XQ153. What effect would that have on the temperature of the wick tube? A. Well, that is a little hard to say. The conductivity of air is very low,

664 that is, the amount of heat which is carried away by an air current is very low.

XQ154. At a 40-mile-an-hour velocity, however, it can convey a great deal of heat away from that wick tube, can it not? A. At a 40-mile velocity your flame is intense and hot itself, so that if you take the summation of the two, which is the only thing you get in this case, the differences wouldn't be very great.

XQ155. You made no measurement which would enable you to give any precise statement of what happened? A. Oh, yes, yes, I measured. Yes, I
665 measured the temperature of the cap and the temperature of the wick at 40 miles.

XQ156. Did you measure the temperature of the wick tube? A. Yes, sir.

XQ157. What was that temperature? A. Well, at 40 miles an hour the Toledo flare gave—

XQ158. I am asking you about the Anthes? A. All right, I beg your pardon. At 40 miles an hour the Anthes flare gave a cap temperature of 414, and a wick temperature of 160.

XQ159. Where was that wick measurement made? A. The wick measurement was made by in-
666 serting a thermometer right in this point, you see (indicating), squeezing the wick apart and putting the bulb of the thermometer right up in there.

XQ160. Pointing to the left hand side of the wick tube on Fig. 2 of Exhibit B? A. That is right.

XQ161. Then you got a measurement of 155 degrees. A. 160 degrees.

XQ162. 160? A. Yes, 160 degrees from the Anthes flare.

XQ163. The bottom flange of the Anthes structure is perforated with holes, is it not? A. Yes, right at 6 here, pointing to Fig. 2, 6 on the other side of Fig. 2.

XQ164. In still air what would be the course of the air current which is being fed to the wick in the Anthes structure? Will you point it out on the drawing? A. You would have a slight air current passing up and out through the openings 3. 667

XQ165. And what would be the course of the air current in still air on the Withrow structure, Fig. 1 of Exhibit B? A. It would come in here—

XQ166. From the side? A. What is that?

XQ167. You are pointing out that it comes in from the side, are you not? A. Yes, in the air opening 10, as well as the other air openings, and then as soon as it mingled with the hot gases it would pass up and go out the opening 9. 668

XQ168. You made some mention of the transmission of heat in these two structures. The holes which you referred to in the bottom of the Anthes structure have a tendency to restrict this transmission of heat, do they not? A. I am not so sure of that because you have radiation here from the flame right straight down, which might make up for any other conditions.

XQ169. You are talking about the conduction, as I understand it, through the metal part of the flame guard? A. But in this case you also have, because you have an opening there, you also have radiation from a hot flame. 669

XQ170. And that radiation from the hot flame is beating particularly on the top of the wick more than it is on the holes in the flange at the bottom of defendant's structure, is it not? A. Well, it is passing out everywhere, wherever there is a straight line, so you have radiation on plate 8, Fig. 2.

XQ171. The air that is being fed in through those holes, as you pointed out, also has a tendency

670 to cool that flange, does it not? I am referring to the portion marked 4 on Fig. 2 of Exhibit B. A. That ordinarily is so slight that I do not think you can measure it.

XQ172. You made no attempt to measure it. A. No, I just measured the temperature of the kerosene in this wick, which would give me an idea—

XQ173. You made no attempt, however, to measure the temperature of the air before it went through the flame guard and after it came out of it? A. That was ordinary temperature, room temperature.

671 XQ174. Was it room temperature when it came out? A. Of course it would be hot when it got out of there.

XQ175. I thought you said air had very little conductivity for heat. A. I said that, yes.

XQ176. And it was hot nevertheless when it came out of the structure? A. Surely, it was in the flame; how could it help but be hot?

XQ177. Now, this Rutz structure about which you testified, I understood you to say in your opinion it could not be used as a satisfactory warning signal. Did you ever try it as a warning

672 signal? A. No, sir.

XQ178. When you stated to the court that in your opinion it could not be used, that was what might be termed an intelligent guess? A. I was talking about this structure over here.

XQ179. You said that that particular structure, in your opinion, would not be usable as a warning signal. A. I doubt if I said that; I do not remember saying that.

XQ180. What is your opinion about it now? A. I would want to test it out before I gave an opinion on it.

XQ181. You made no test of it? A. No, I made 673
no test of it.

XQ182. You are aware that the structure used as a cap on Exhibit L is a device manufactured by the Milwaukee Gas Specialty Company in accordance with the Rutz patent? A. I will take your word for it.

XQ183. It was, I will say that. Are you still of the opinion that it would not satisfactorily operate as a flare? A. I would want to test it out and find out. I do not know whether that will stand high wind velocity or will give much light, whether the openings are big enough for the flame or whether 674
the openings for the gas down there are sufficient I do not know about that.

XQ184. Do you consider the only difference between the structure of the patent in suit and Rutz is one of whether the Rutz holes should be larger? A. Well, there is an awful lot of difference between that structure and this, even as it stands.

Mr. Darby: When you say that, you point to Fig. 3.

XQ185. Which? A. Fig 3. This is designed for gas flames to shoot out, and presumably it is satisfactory for that purpose. 675

XQ186. They are both for the burning of vapor? A. After you once produce the vapor in this case, and you have a vapor ready in this case under pressure.

XQ187. Do you consider that any material difference? A. I absolutely do.

XQ188. What is the difference? A. You do not have to have any wick, or you do not have to have any container for your oil, you do not have to vaporize the oil, you do not have to provide for a flame coming out; there are lots of things that are different.

676 XQ189. However, it can be used to take care of all of those purposes, can it not? A. It can be used for the purpose for which it was designed, and used satisfactorily, that is what I understand about it.

XQ190. You do not know what other purposes it might be used for? A. I do not know. I know it is a flash igniter for a stove, and it is used for that purpose.

XQ191. Have you ever seen one in operation? A. Well, I have one on a gas stove at home.

XQ192. Did you ever place your finger on top
677 of it when it was operating? A. I never did test it, no.

XQ193. You do not know whether it gets hot or not? A. I couldn't tell you.

XQ194. The flame is a blue flame, is it not, from the gas? A. Not in mine; it is a light flame.

XQ195. In your burner at home? A. Yes.

XQ196. Have you any idea what its temperature is? A. I do not know. I could test it, but I have not done so. There is no reason why I should.

XQ197. The heat from that flame is rising, is it not? A. You mean from the little pilot flame
678 inside?

XQ198. Yes. A. That is a very small flame.

XQ199. Nevertheless it is hot? A. Yes, it is hot, but the total amount of heat is very small.

XQ200. It rises nevertheless? A. Yes.

XQ201. It is going on all the time? A. There are little air currents that will go up here.

XQ202. And the top of the burner would naturally get hot? A. Well, you have a large amount of surface there and you have a very small amount of heat.

XQ203. As a matter of fact, Professor, it is a

good deal more important for Rutz to have a fool- 679
proof structure than Withrow to have his fool-
proof for his conditions? A. Yes.

XQ204. His flame could not go out, because if it did, there would be danger of escaping gas? A. You would smell it.

XQ205. Yes, but you might not be there? A. Then it would not do any harm.

XQ206. It would cost you a lot of maney? A. No, not necessarily.

XQ207. You made no measurements or observations whatsoever of the Rutz structure either operating as a flare? A. No. 680

XQ208. All you were testifying about with reference to that structure is what you guessed about it? A. I wouldn't say that, no.

XQ209. You have no opinion then as to what wind velocity that Rutz burner would stand? A. I could give you a guess. You seem to like guesses.

XQ210. No, I disregard them entirely. I should very much prefer to have data. A. I have already told you that I haven't tested it, so the only thing I could do is to give you a guess.

XQ211. I do not care for any guess, so we will withdraw the question. A. Well, we will settle it 681
on that basis.

XQ212. I show you a copy or a model of the Malcov structure, Defendant's Exhibit I.

The Court: As I recall it, I understand the witness, I may be in error, is in disagreement about this, he says that this does not quite represent it, there are four openings, and I think he said he believed the patent offered two.

Mr. Wisner: I want him to point out on the

682 drawing eventually, Judge, under what theory he gets only two openings.

The Court: All right.

XQ213. Did you ever observe that structure in operation? A. No, sir, I did not.

XQ214. In testifying about its operative characteristics you were only telling what you thought about it, not what you knew about it? A. Right, using my experience, and so forth.

XQ215. I now hand you the drawing of the Malcov patent No. 1163 of the year 1868; the figure at the bottom of page 1 is a side elevation, is it
683 not? A. I believe so.

XQ216. In a side elevation it would only show two air inlets on the side from which the elevation is taken, would it not? A. Unless the front part is where the air goes in. I can conceive that this would be the metal on this side, and this the opening (indicating). In other words, I can conceive that this is metal, and that this is open space, and this metal goes across and makes the top.

XQ217. Now just a moment— A. Yes, sir.

XQ218. The entire portion in which the dots are shown in this structure is a solid piece of metal
684 except for these minute openings? A. Well, of course you have drawn it here according to your conception of this thing, but if I should draw it according to my conception I would put the wings on each side and I would extend those across and make the top.

XQ219. You would put a dome across the top? A. Yes, with these two wings.

XQ220. And on the side there would be— A. Metal.

XQ221. Metal? A. Yes, sir, on two sides. That

is just a matter of speculation, because it is not very clear. 685

Mr. Wisner: I ask that the witness' voluntary statement be stricken out as not responsive to any question.

The Court: He just said it is a matter of speculation. Do I take your testimony that you couldn't say whether there are two or four openings on this?

The Witness: Two or four supports for the perforated top. I do not think it would make a great deal of difference.

The Court: That isn't the question, whether it would make any difference. 686

The Witness: As I read the patent, I conceive that these two wings being of metal, and this being the opening, then these would be connected across the top with a metal with perforations in it.

XQ222. In draftsmanship, Professor, it is customary, is it not, to have a heavy line on the right-hand side of the drawing and a lighter line on the left, on the theory that the light comes down over the left shoulder? A. Maybe so.

XQ223. You do not know whether that is the fact? A. No, I couldn't testify as to what the custom is in Russia. 687

XQ224. You notice, however, on what is marked in the patent, an arc marked D on the left-hand side of the structure, there are two lines, one light and one heavy? A. Yes, I notice that.

XQ225. And the right-hand line is heavy? A. Yes.

XQ226. And on the arc marked D on the right-hand side of the structure— A. Yes.

XQ (continuing)—there are two lines? A. Yes.

688 XQ227. And the most right line, the one most to the right, is a heavy line? A. Yes.

XQ228. And the other line is a lighter line? A. Slightly lighter, yes.

XQ229. You will further notice the two lines in the middle of the structure, the one on the right is lighter than the one on the left? A. The one on the right is a much lighter line; you can hardly see it.

XQ230. Are you experienced in mechanical draftsmanship? A. Not much.

XQ231. You made some reference to the Argand
689 patent. Among other things, you pointed out that he prescribed a chimney or pipe— A. Yes.

XQ (continuing)—which surrounded the flame? A. Yes.

XQ232. He also prescribes a dome, does he not? A. I do not recall the dome that he described; that I do not recall.

XQ233. However, the portion marked 8 in Fig. 1 of Defendant's Exhibit B, the metal top, might be referred to as a dome, might it not, without doing any violence to the meaning of the word "dome"? Does the word "dome" describe that structure on
690 the top? A. Oh, it might, yes; you might use that word.

XQ234. Were you asked any questions about Defendant's Exhibit J, a model of the Salsbury structure? I do not remember. A. I do not believe I was; I do not think I was.

XQ235. You never made any tests of such a structure as this Exhibit J? A. No.

XQ236. You are not informed as to its operative qualities? A. No.

The Court: Apparently the open tops, that is an open one, isn't it?

The Witness: Yes, open top. 691

The Court: Apparently none of the open ones would work in bad weather, that is, where you have a lot of rain.

Mr. Wisner: Some of the testimony has been an inordinate amount of rain; our testimony is that this one worked perfectly in a snow storm.

The Court: I am talking about rain.

Mr. Wisner: Extraordinary rain.

The Court: Just the rain that you get on a highway.

Mr. Wisner: I admit very frankly, Your 692
Honor, that the rain, heavy rain, would put this one out, but for most purposes it would perform its operations.

The Court: I do not think that you now seriously contend that that is an anticipation.

Mr. Wisner: It shows every thing but a metal top.

The Court: That is the question. We are going to narrow this issue down, I think, when we get through, pretty close to Rutz here.

Mr. Wisner: I told Your Honor in the beginning that Rutz was something that we 693
wanted to keep our eye on all the way through.

The Court: Those where you have an open flame, in rain on a highway, and you do get rainstorms—

Mr. Wisner: Oh, yes, I admit that.

The Court: They will put the light out; isn't that so? If you apply rain there it will put that light out?

The Witness: Surely.

Mr. Darby: I might say, Your Honor, it might be helpful to say that that is really the

694 issue here, Rutz. And that was the issue in the Sixth Circuit, Kahn, I think his name was, showing exactly the same thing. So whether it is Rutz or Kahn, the issue narrows right down to that proposition.

XQ237. It is true, is it not, Professor, that the metal parts of all kerosene lamps which are constructed to use kerosene become hot during the operation? A. No, it isn't true.

XQ238. In what case is it not true? A. The metal parts in contact with the flame would undoubtedly get warm, depending on their contact
695 with the flame. The metal parts not in contact with the flame would not get hot.

XQ239. It would not be possible to prevent a wick tube from getting hot, would it, in a kerosene lamp? A. There are patents that try to keep that from getting hot by insulating it.

XQ240. You say "try"? A. Well, doubtless they are more or less successful in preventing the wick tube from getting hot. There are conditions where they think that is necessary to do that in their design.

XQ241. Ordinarily, however, without some par-
696 ticular attention being directed to insulating or some other feature of that kind to prevent the wick tube from becoming hot, it becomes hot as a matter of course? A. You can design a thing for it to become hot, and you can design for it not to become hot, prevent it from becoming hot, and you can leave it alone to take its own course. You can do any one of those three things.

XQ242. And if you wanted to transmit heat, get it hotter, if that performs any useful function, you can use copper? A. There are various reasons why we use copper and why we do not use copper.

We use steel in the chemical industry a hundred times instead of copper, when we transmit heat; we do that continuously under present-day practice. 697

XQ243. Steel has good qualities for transmitting heat? A. It is a good conductor of heat, and it has other qualities which copper does not have.

The Court: Is Kahn the same in effect as Rutz?

Mr. Darby: May I approach Your Honor with this?

The Court: Certainly.

Mr. Darby: The Kahn patent is in evidence, and without taking the time to read it to you— 698

The Court: I just want to know. You seem both to agree on it, so we won't have to waste much time on that.

Mr. Darby: You see, it is just the same thing, it is virtually the same in every essential respect as the Rutz patent.

Mr. Wisner: I might say that the evidence shows that Rutz superseded Kahn shortly after Kahn went on the market, and has been universal ever since.

XQ244. Now, when you are making comparative tests, Doctor, the most accurate scientific comparisons are obtained by using two devices, are they not? A. Using what? 699

XQ245. Two devices exactly similar. A. It depends entirely on what you are doing.

XQ246. Suppose you want to compare the operation of a pair of flares, one without a burner cap and one with a burner cap; the most accurate results are obtained if you eliminate the most variables, are they not? A. It depends on what you are testing. You will have to state the conditions

700 before you can have me answer that question.

XQ247. Suppose you want to determine their performance. A. Well, you still haven't told me why you take the cap off.

XQ248. Because you want to determine the performance with the cap and without the cap. A. If that is worth doing I would do it, but I still don't know why I do it.

XQ249. You eliminate a variable by using the same torch body, do you not? A. Well, you may want to have variables in.

XQ250. In any test of performance you want at
701 least two variables, do you not? A. Why, if the variables are inherent to the device, you want them in, you do not want to throw them out, because you want to know what those variables will do.

XQ251. How many variables can you measure? A. There may be a dozen of them.

XQ252. All at the same time? A. Yes.

XQ253. And can you accurately draw inferences from a dozen variables that you are measuring? A. If you wish the performance of a piece of equipment that is designed and operating, you want to take the whole thing as it is and then find
702 out what it will do.

XQ254. You can't possibly find out what it will do unless you measure the variables one at a time, can you? A. If you are trying to design the thing, that may be a different story, but if you trying to find out what it will accomplish, you have to take it as it is, that is the only way you can do it.

XQ255. And measure all the variables simultaneously? A. You note them, yes. You may note a half a dozen things if they are pertinent, yes.

XQ256. In your observation of the performance of the two flares, one belonging to the plaintiff and

the other to the defendant, you measured only wind resistance? A. Well, if I want to get fuel consumption as against wind resistance, why, I would measure the two. 703

XQ257. Yes. A. But there would be a number of variables that I found here, and therefore I used duplicates, I used three flares of each kind to find out if the three identical flares, so-called identical, would give me the same results, and I found that they did not.

XQ258. Have you your figures on the operation of the Withrow torch where you used three flares? A. Yes, sir; yes sir. 704

XQ259. Did each of the flares withstand the same wind? A. Let me get my figures and I will answer your question. These experiments were conducted under outdoor conditions where they were subject to the wind velocities that happened to come and go during that day.

XQ260. I am asking you now about those which you stated you measured. You say they were subjected to a 30-mile wind; did they all withstand that? A. You are talking about fuel consumption?

XQ261. No, I am talking about withstanding wind for the Toledo flare. A. Withstanding wind in what respect? 705

XQ262. You said you subjected them to wind tests. A. You will have to tell me what you are trying to get at. I do not know what it is.

XQ263. I want you to answer my question, did you subject the Toledo flare to wind tests? A. I can't answer that question.

XQ264. Did you subject the Anthes flare to any wind tests at any time? A. I can't answer that question.

706 XQ265. Did you subject anything that was submitted to you to any tests? A. Yes.

XQ266. And were one of those tests wind tests? A. No.

XQ267. You subjected them to no wind tests? A. No, as I understand you. I do not know what you are talking about, but as I understand you, my answer is no.

XQ268. Did you subject them, or did you make tests of them in which wind was one of the variables which you were considering? A. Yes.

XQ269. You did that for the Toledo flare? A.
707 I did.

XQ270. For three of them? A. I did.

XQ271. At 30 miles an hour? A. Under the conditions prevailing outdoors.

XQ272. You measured the wind outdoors? A. I took it from the Weather Bureau.

XQ273. Where were these flares set? A. At the Polytechnic Institute, on the fire escape, about the fourth floor.

XQ274. Where is the Polytechnic Institute—that is in Brooklyn? A. Yes.

XQ275. And where is the Weather Bureau
708 located in Brooklyn? A. I do not know.

XQ276. You do not know at what elevation above the ground? A. No.

XQ277. And you do not know anything more than the Weather Bureau said there was a 30-mile wind somewhere in the vicinity of New York? A. Yes.

XQ278. And you assumed it was a 30-mile wind, is that it? A. No.

XQ279. I thought you said you subjected it to a 30-mile wind. A. I didn't say that.

XQ280. You simply tested it when somewhere

in New York there was a 30-mile wind blowing? 709
A. I tested them for a day when I had a lot of wind blowing, sometimes strong, sometimes weak, and I have a record of the Weather Bureau as to what the velocities were on that day, and I suppose I had varying wind conditions, and they were all exposed alike. I measured the fuel consumption under those practical conditions to find out if they operated alike.

XQ281. Isn't the Weather Bureau on top of the Whitehall Building at Bowling Green? A. It may be so.

XQ282. You do not know whether it is so or 710
not? A. And I do not care.

XQ283. That is a twenty-five story building? A. Possibly.

XQ284. You do not know? A. I do not know.

XQ285. Are those the only measurements of wind velocity that you made? A. No.

The Court: When did you make that test?

The Witness: This was made, I do not know, maybe a couple of weeks ago; it was during that period when there was heavy wind.

The Court: We have had a lot of wind around here; it was blowing people's hats all 711
over the street, I remember seeing a man's hat blowing all the way down to Borough Hall. Whether it was on that day or not, of course, I do not know.

The Witness: It was a couple of days during that period when we had heavy wind that we made that test.

The Court: Ten days or two weeks ago we had quite heavy wind; whether it was on that day or not, I do not know; we had a lot of wind around here.

712 XQ286. You measured neither of these devices under wind velocities of less than 20 miles an hour, did you? A. I believe not. I will check and see. I do not think I did.

XQ287. So— A. Unless these outdoor tests, they probably had less than 20 miles an hour at times.

XQ288. So in your testimony on direct examination you are not seeking to cover anything other than wind between 20 and 30 miles an hour? A. I will admit that that is what they cover.

XQ289. And that you determined by the report
713 from the Weather Bureau for that day? A. No, some of these tests were made in a wind tunnel.

XQ290. That is what I was getting at; which tests were those? A. All right, sir, I will tell you. The measurements of the temperature of the cap and the wick were made in the wind tunnel at 20 and 40 miles, and also—

XQ291. At 20 and 40? A. 20 and 40, that is, the measurements of the cap temperature and the wick temperature were 20 and 40, and quiet conditions in the laboratory with practically no wind. I also have measurements of illumination or light
714 given off at 20, 25 and 30. They were also made in the wind tunnel.

Mr. Wisner: Are these the same that were put in evidence when Mr. Close testified?

Mr. Owen: No, they are not; I think they are different. Those were made at Toledo, and these the doctor is speaking of were made here in New York.

XQ292. All of the fuels that were used for devices such as Withrow and as Rutz are hydrocarbon fuels, are they not? A. Well, as far as Withrow and Anthes are concerned, they are

hydrocarbons; so far as Rutz is concerned, there 715
are some hydrocarbons in gas, but there are also other constituents which are not hydrocarbons, so that Rutz could not be said to have been made with hydrocarbons, because there are some other constituents in gas.

XQ293. What are those constituents in gas which are not hydrocarbons? A. For instance, there is hydrogen and there is carbon monoxide.

XQ294. Those are both constituents of hydrocarbon gas, are they not? A. They are not hydrocarbons.

XQ295. Do I understand you that when the gas 716
is vaporized the oxygen is burned in a flame? A. I do not understand your question.

XQ296. You said that hydrogen and carbon dioxide— A. Carbon monoxide.

XQ (continuing)—were not to be found in a hydrocarbon gas? A. They are not hydrocarbons.

XQ297. However, oxygen and carbon are both found in hydrocarbon, are they not? A. Hydrocarbons consist of oxygen and carbon combined.

XQ298. In various mixtures? A. Yes, in a number of proportions.

XQ299. The things that give the illuminating 717
quality to the gas in such a device as Rutz or a gas jet in your house are the hydrocarbons, are they not? A. You are entirely right.

XQ300. They give the luminescence? A. Yes, they are, about—

XQ301. They cause—

Mr. Darby: Let the witness answer.

The Witness: Gas contains about 12 or 13 per cent of those hydrocarbons.

XQ302. They are the ones which give the luminescence to any flame? A. Give the light, but be-

718 ing only 12 or 13 per cent, you have a very different situation than where you have 100 per cent, that is a ratio of 1 to 8, so you have got a different story.

XQ303. You have examined the test data of Professor Croft? A. Yes, I have read it.

XQ304. In your tests were you seeking to disagree with his observations, that is, at velocities of less than 10 miles an hour? A. I do not think his tests amount to much.

XQ305. I am not asking you about that, I am saying are your tests supposedly comparable with
719 those run by Professor Croft? A. They were run for a different purpose entirely.

Re-direct Examination by Mr. Darby:

RDQ306. Just one question. With reference, Dr. Olsen, to the particular tests where you put a number, one or more of these flares out on a fire escape on the fourth floor of the Institute, what was the purpose of that test? A. I wished to ascertain the fuel consumption of these flares under practical conditions, particularly on a windy day, to see what
720 they would burn.

RDQ307. And how many burners of the plaintiff's type did you use? A. I had three Toledo flares.

RDQ308. And how many burners of the defendant's type did you use? A. Three of the Anthes flares.

RDQ309. Was it your object to subject them to identical conditions? A. That was my purpose.

RDQ310. Were you the least bit concerned with the velocity of the wind for that purpose? A. No.

RDQ311. You did, however, take the trouble to

ascertain what the Weather Bureau report of windage was for that particular day? A. Right. 721

RDQ312. What was it. A. At 7 A. M. it was 19 and at 7:20 P. M. it was 20 miles an hour.

RDQ313. You stated a minute ago that you did not think that Professor Croft's test amounted to much? A. Yes.

RDQ314. Please state your reason. A. He made a comparison with the flares with and without a cap, and I do not think that showed any—I was not interested in knowing what they did without a cap. He also tested at a very low wind velocity, something under 8 or 9 miles an hour. 722

RDQ315. Referring again to this fire escape test for fuel consumption, what did you find was the average fuel consumption of the three Anthes flares and the three plaintiff's flares? A. The Anthes flare gave me results in ounces of fuel consumption per hour of 2.34, 1.76 and 2.14, and the average of those is 2.05.

RDQ316. What was the average of the others? A. 1.95.

RDQ317. For whom? A. For the Toledo and 2.05 for the Anthes. You see, they are very close to two ounces. There is very little difference. 723

Re-cross Examination by Mr. Wisner:

RXQ318. These figures that you have just submitted on fuel consumption were acquired by measuring the device before you started lighting it and after finishing? A. Yes.

RXQ319. There were no measurements taken during the period of how much fuel it was consuming? A. No.

724 RXQ320. The measurement was by weighing the device? A. Yes.

RXQ321. And there are differences in size of the torch bodies of the two structures? A. The Anthes and Toledo flares were all alike. They differ somewhat, of course.

RXQ322. In size? A. Yes, I think so.

RXQ323. And no constants were kept of the amount of fuel level? A. We filled them all full at the start and we let them run.

RXQ324. And that is all the data you have on fuel consumption? A. Of course, I have it on other
725 flares. I have the data on the flares with the great big wick on them.

RXQ325. Did you make any tests at any time on the road or street? A. No.

RXQ326. They were made either indoors or up on the fire escape? A. Yes.

RXQ327. You do not recognize, I assume, that still air ordinarily prevails outdoors? A. Not by my observation.

RXQ328. Have you ever seen a fog? A. Yes.

RXQ329. And a fog is a thing which greatly impedes the passage of light? A. Yes.

726 RXQ330. And ordinarily in a fog it is practically still air, otherwise there would not be a fog? A. Not much movement.

RXQ331. It is the most dangerous condition you can have on the road? A. I don't know whether I should say that.

RXQ332. However, it is replete, is it not, with possibilities for accidents? A. It is better, of course, when it is clear, but whether it is the worst condition or not, I do not want to say.

RXQ333. If you wanted to determine how to go about to ascertain an increase of efficiency that

results by placing a flame guard on this structure, 727
how would you do so? A. I might not be interested in determining that.

RXQ334. Suppose you were asked to work on that problem. A. If I was asked the problem to determine the efficiency of a flare with and without a cap, I should immediately want to have a flare that would be satisfactory and operate under practical conditions, and then I would take a flare designed with a cap on it and compare those two. I would not take a cap off a flare and leave other things the same.

RXQ335. You would not be interested then in 728
eliminating all possible variables, you would want to interject as many possible variables in your testing as you could? A. I would determine how that flare operated and resisted a 40-mile-an-hour wind, and after that—that is not the state of mind I would be in when I carried out the experiment, no. I would not take in any more variables than necessary.

RXQ337. You admit it is desirable to eliminate variables in a performance? A. It depends upon what testing you are carrying out.

RXQ338. If you were going to carry out an 729
efficiency test on this structure to see what the effect of the addition of a flame guard would be, to do so and to have any scientific accuracy to that test, you would want to keep the size of this body constant? A. You will have to tell me just what efficiency test I would be interested in carrying out.

RXQ339. You are competent to make an efficiency test? A. I would determine first what the device is to be used for and what purpose it must have to be useful, and then find out how well it

730 performs that function, and that I would call efficiency.

RXQ340. Is that the recognized mechanical engineering definition of efficiency? A. Yes.

RXQ341. The definition of "efficiency" and the only proper definition is how much you get out of what you put into it? A. Not necessarily.

RXQ342. What other definitions are there? A. I just gave you a definition. Find out what the device is to be used for and then ascertain how well is fulfills that particular function, whatever it may be, and then you will know what its effi-
731 ciency is.

RXQ343. Do you recognize Kent's Mechanical Engineer's Pocket Book as a standard work? A. Surely.

RXQ344. On page 12 of the Edition of 1913, the definition of efficiency is defined as follows:

"Efficiency is defined in engineering as the quotient 'output divided by input', that is the energy utilized divided by the energy expended." A. That is a particular test made for a particular use. I have a handbook of my own which is just as authoritative as that, and I am just as capable
732 of telling you how you test for efficiency as Mr. Kent is,

RXQ345. Suppose you wanted to get the candle power of this device per ounce of fuel consumed per hour, how would you do it? A. If I was interested in that, I would make a test of the candle power and the fuel, and if you wanted it per hour, I should probably make a number of candle power tests throughout the hour, to be sure I had an average or mean which represented any differences that might occur from time to time. I would weigh it before and after, and then I would get candle

power per ounce of fuel consumption. 733

RXQ346. Then you would have the device's efficiency, would you not? A. In that particular respect, yes.

By Mr. Darby:

RDQ347. What is the name of your handbook, Doctor? A. It is the Chemical Annual. D. Van-Nostrand's Chemical Annual, and I am the editor of it.

RDQ348. And what other books have you written? A. I have written a book on quantitative analysis, which has been printed in several editions, also qualitative analysis, and have a textbook on 734 chemical engineering. I have a book on foods. I have edited 17 volumes of translations of the American Institute of Chemical Engineering.

By Mr. Wisner:

RXQ349. Do any of them discuss the subject of lighting or flares? A. In the chemical engineering book we have to discuss fuels and their consumption, but we did not come down to flares. We thought that was a rather simple subject.

The Court: I am going to think out loud, just to narrow the issues. I do not usually do 735 this in patent cases, and, of course, it is subject to revision later on. I do not think much of this claim as to infringement, I think the language that Judge Hahn used here is particularly applicable. I think the real question here is one of validity and I think the Rutz patent is one that will have to be considered seriously. I suppose so far as the covering of a fire is concerned, I suppose from the time that we have had fires, they have realized that it is well to cover the fires to protect it from the weather. I think it can be narrowed down considerably.

PLAINTIFF'S EXHIBIT NO. 1

247

248

Oct. 22, 1929. J. E. WITHROW ET AL 1,732,708.

BURNER

Filed Dec. 26, 1928

Fig. 1

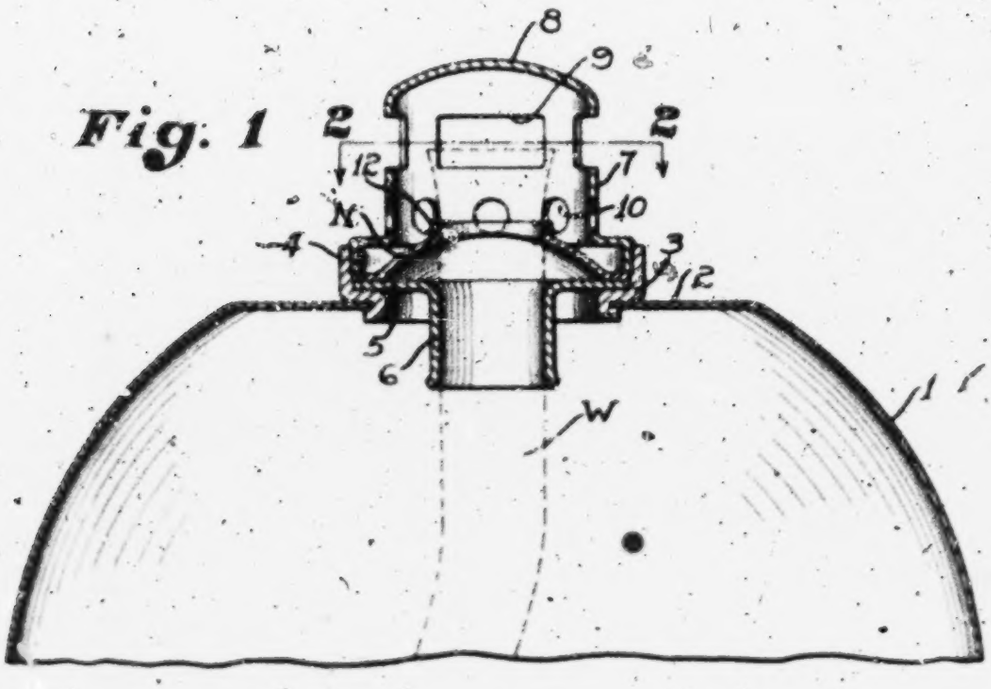


Fig. 2

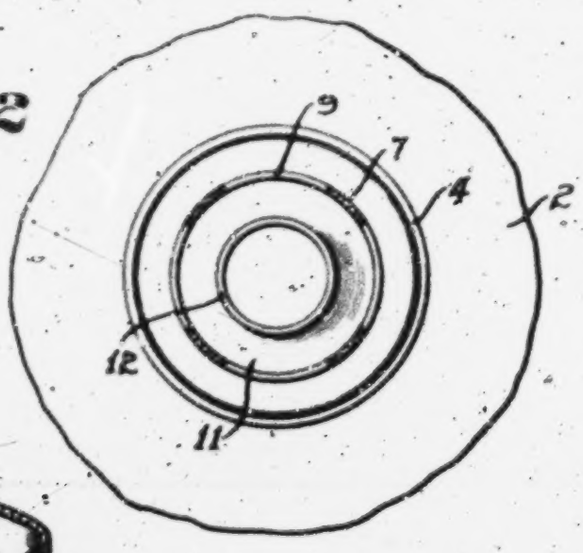
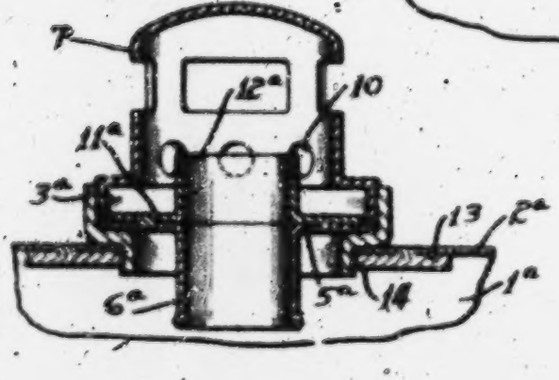


Fig. 3



Joseph E. Withrow
Lyman W. Clark
Otolin

Patented Oct. 22, 1929

1,732,708

UNITED STATES PATENT OFFICE

JOSEPH E. WITHROW AND LYMAN W. CLOSE, OF TOLEDO, OHIO, ASSIGNORS TO THE TOLEDO PRESSED STEEL COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO

BURNER

Application filed December 20, 1926. Serial No. 155,432.

This invention relates to street torches, such as are commonly used for illuminating road obstructions, and usually referred to as construction torches, but more particularly to devices for increasing the efficiency of such torches and militating against extinguishment of the torch flame, and an object is to provide a simple and efficient attachment for torches of the above character for increasing the efficiency thereof and materially reducing the liability of extinguishment of the flame by high winds. Another object is to provide a burner so constructed and arranged that liability of extinguishment of the flame by high winds or by rain is reduced to a minimum. Further objects are to provide a device of the above character which may be inexpensively manufactured and has the new and improved features of construction hereinafter described.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a vertical sectional elevation of a torch with the device applied thereto;

Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a vertical sectional elevation of an alternate form of burner.

The illustrated embodiment of the invention comprises a sheet metal torch 1 of substantially frusto-spherical shape having an opening for a wick in its upper end 2. Crimped over the edges of such opening is a member 3 having an outwardly extending annular flange 4, which is internally threaded. Resting on the shelf formed by the member 3 is a disc like member 5 having a central tubular extension 6, which projects inside of the torch body 1 a substantial distance. A wick W is adapted to extend through the extension 6 and to be held in position thereby.

Screwed onto the threads of the annular flange 4 is a cap 7, which extends inwardly from the flange 4, and then upwardly. The upper wall 8 of the cap 7 is imperforate, and as shown, is dome shaped. Formed in the side walls of the cap beneath the end wall 8 is a series of relatively large rectangular openings 9 through which the flame of the torch passes. Beneath the openings 9 are series of relatively small air ports 10, through which air passes to the inside of the cap for the torch flame. It will be observed that the cap is of such dimensions that the side walls thereof are spaced from the sides and end of the wick W.

Resting upon the disc shaped member 5 is an arched disc 11 having an upwardly extending annular flange 12 terminating in the region of the air ports 10. As shown, the upper end of the extension 12 covers approximately one-third of the area of the ports 10. The function of the disc 11 is to prevent the air entering the inside of the cap 7 from cooling the wick W to such an extent that the temperature of the oil passing up the wick is reduced below the desired point.

When the outer end of the wick W is lighted the oil passing up the wick by capillary action is heated, thereby maintaining the oil in the region of the outer end of the wick at the proper flashing point. This heating of the wick is facilitated by the reflection of heat from the dome-shaped cap and by conduction to wick-holding collars 12 and 6 from their supporting flanges, flange 11 receiving reflected heat and being in contact with the lower edge of the heated cap. Air inlet openings 10 being above the lower edge of the cap leaves a space within the cap and above the flange of the wick holder for comparatively quiescent air. This quiescent layer of air, in contact with the wick holder and the restriction of inlet ports to admit to the wick and holder only such air as is needed for combustion aids in maintaining the heat of the wick holder and wick. This militates against extinguishing the flame by high winds. Sufficient cool outer air is supplied to the end portion of the wick through the ports 10 for securing a satisfactory flame, and the latter extends through the openings 9 to provide a satisfactory signal. It has been found that with the above described construction and arrangement, the oil consumption is materially decreased. It is also found that the amount of wick used is likewise decreased. Another outstanding advantage resides in reducing the liability of extinguishing the flame by high winds or rain.

In the embodiment shown on Fig. 3, there is fixed, as by welding to the torch body 1ª, a ring 13 which surrounds the opening in the top wall 2ª and the walls of the opening are formed with screw threads 14 to receive a flanged member 5ª. This permits the burner to be attached to or detached from the torch as a unit. In this form the disc 5ª has an inwardly extending wick-receiving tube 6ª, and fixed to the upper surface of the disc 5ª is a disc 11ª provided with an upwardly extending flange or tube 12ª. The upper end of the flange 12ª covers approximately one half of the openings 10 of the cap 7. It will be understood that the arrangement of tubes 6ª and 12ª may be used to advantage in the form shown in Fig. 1.

While we have shown and described constructions which admirably fulfill the objects primarily enumerated, it is to be understood that the above description is given by way of illustration and not of limitation, and numerous changes in details of construction and arrangement may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What we claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a torch body having an opening at its upper end, a wick-receiving tube extending into said opening, and a cap disposed on the outer side of said torch body to enclose the outer end of the wick, said cap having an imperforate upper wall, lateral flame openings, and air openings below the flame openings.

2. In a device of the class described, a torch body having an opening for a wick, and a flame guard for said wick mounted on the outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports.

3. In a device of the class described, a torch body having an opening for a wick, an outwardly extending flange in the region of said opening, and a flame guard detachably connected to said flange and comprising a cap provided with side flame openings and air ports.

4. In a device of the class described, a torch body having a wick opening, an outwardly projecting flange in the region of said opening, a wick-receiving tube extending inside of said torch body, and a guard for the outer end of the wick engaging said flange, said guard comprising a removable cap having an imperforate top, side flame openings and air openings.

5. In a device of the class described, a construction torch having an opening in its upper end for a wick, means to hold the wick in place, and a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having an imperforate top wall and side flame and air openings.

6. In a device of the class described, a torch body having a wick-opening, a tube for receiving the wick and adapted to extend inside of the torch body, an outwardly extending flange in the region of said wick-opening and a cap connected to said flange and having an imperforate top wall, said cap having a flame opening adjacent its outer end and an air port beneath said flame opening.

7. In a device of the class described, a torch body having a wick-opening, a cap for enclosing the outer end of the wick but spaced from the sides thereof, an imperforate end wall for said cap, said cap having a series of flame openings and a series of air ports beneath the flame openings, and a disc adapted to embrace the wick and having a flange upper portion disposed in the region of the air ports.

8. In a device of the class described, a torch body having a wick opening, an outwardly extending flange in the region of said opening, a wick tube extending inside of said torch body, a cap adapted to enclose the outer end of the wick and engaging said flange, an imeprforate end wall for said cap, said cap having a series of flame openings and a series of air ports beneath said flame openings, and a flanged disc adapted to embrace the wick and having its upper end disposed adjacent said air ports.

9. In a device of the class described, a burner unit adapted for attachment to a torch, said unit comprising a supporting member for engagement with a torch body, a wick-holding member having oppositely extending flange portions for embracing a wick, and a cap superposed upon said supporting member, said cap being provided with vertically spaced air-inlet and flame-outlet openings.

10. In a device of the class described, a burner unit adapted for attachment to a torch, said unit comprising a supporting member for engagement with a torch body, a wick-holding member having oppositely extending flange portions for embracing a wick, and a cap superposed upon said supporting member, said cap being provided with vertically spaced air-inlet and flame-outlet openings, the upper end portion of one of said flange portions covering approximately one-half of said air-inlet openings.

11. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a supporting and heat-receiving flange, and means enclosing a space above said flange and surrounding the wick, except for provision for lateral exit of flame and restricted entrance of air for combustion.

12. A burner for a construction torch

adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a lateral flange, and a cap enclosing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange.

13. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a laterally extending flange and a cap over the wick, the cap having an imperforate, dome-shaped top wall, a lateral flame opening approximately even with the top of the wick and a smaller opening for the inlet of air lower than the flame opening and above the lower edge of the cap, said lower edge being in heat-transferring relation to said flange.

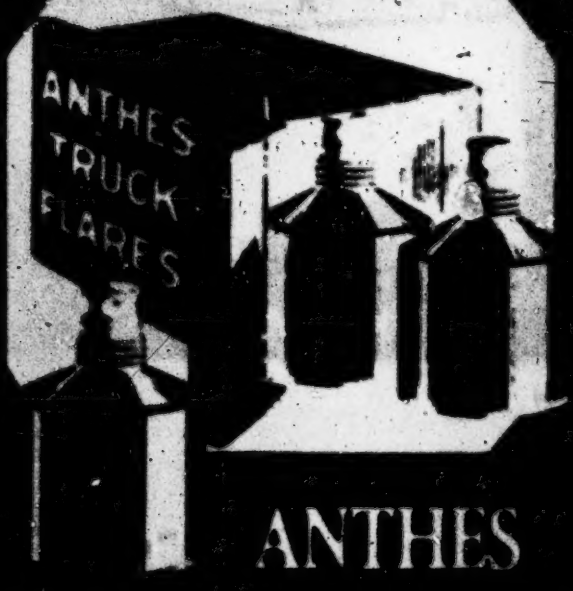
14. A construction torch adapted to emit a luminescent flame and comprising a fuel receptacle with an opening in its top, a wick extending upward through said opening, a wick holder having a collar holding the wick and a flange resting in said opening, and a cap screwed into said opening and against said flange, the cap surrounding and being opened from the end of said wick, having an imperforate, dome-shaped upper wall, lateral space for the exit of flame adjacent said wall, and restricted inlet for air beneath said space.

In testimony whereof we have hereunto signed our names to this specification.

J. E. WITHROW.
LYMAN W. CLOSE.



U.S. District
Court E.D.N.Y.
In Equity
Exhibit



APPROVED

ANTHES

TRUKFLAR

U.S. District
Court E.D.N.Y.
In Equity
Exhibit

FAST SE

LINE...



BY PIONEERS IN
LEAKPROOF
CONSTRUCTION



APPROVED DESIGN

ANTHES FORCE OILER CO.
FORT MADISON IOWA

• The new safety regulations of the Interstate Commerce Commission specify that each truck or bus under its regulation which does not operate entirely on well lighted streets or highways shall carry at least three oil-burning flares in a carrier, at least two red flags and at least three red burning fuses.

• You can meet these requirements by equipping your vehicle with the new No. 53F Toledo Truck Flare Kit. Each oil burning flare in this kit will burn under any weather conditions for more than the time required by these regulations, and will also exceed all other requirements of the law.

• The flares in this kit are of the required size and are made of durable, fast color material.

• The fuses are made in accordance with the specifications of the Bureau of Explosives and are so printed on their labels. Although the requirements are satisfied with 1 fuses which burn only 15 minutes, here are 3 fuses which each burn 30 minutes.

• The fuses are installed in a steel tray which is carried at the top of the case, or may be removed and hung up on the wall of the cab.

• The case is a well styled container made of heavy gauge steel, in which all sharp corners have been eliminated and care has been taken to give it a quality finish in keeping with the honest value of the entire kit. It may be attached in any desired location or position, or carried by a convenient handle. A spring lock keeps the cover shut and provides a place for a padlock, if desired.



No. 53F



THE TOLEDO PRESSED STEEL COMPANY

TOLEDO · OHIO

Parts List and Specifications

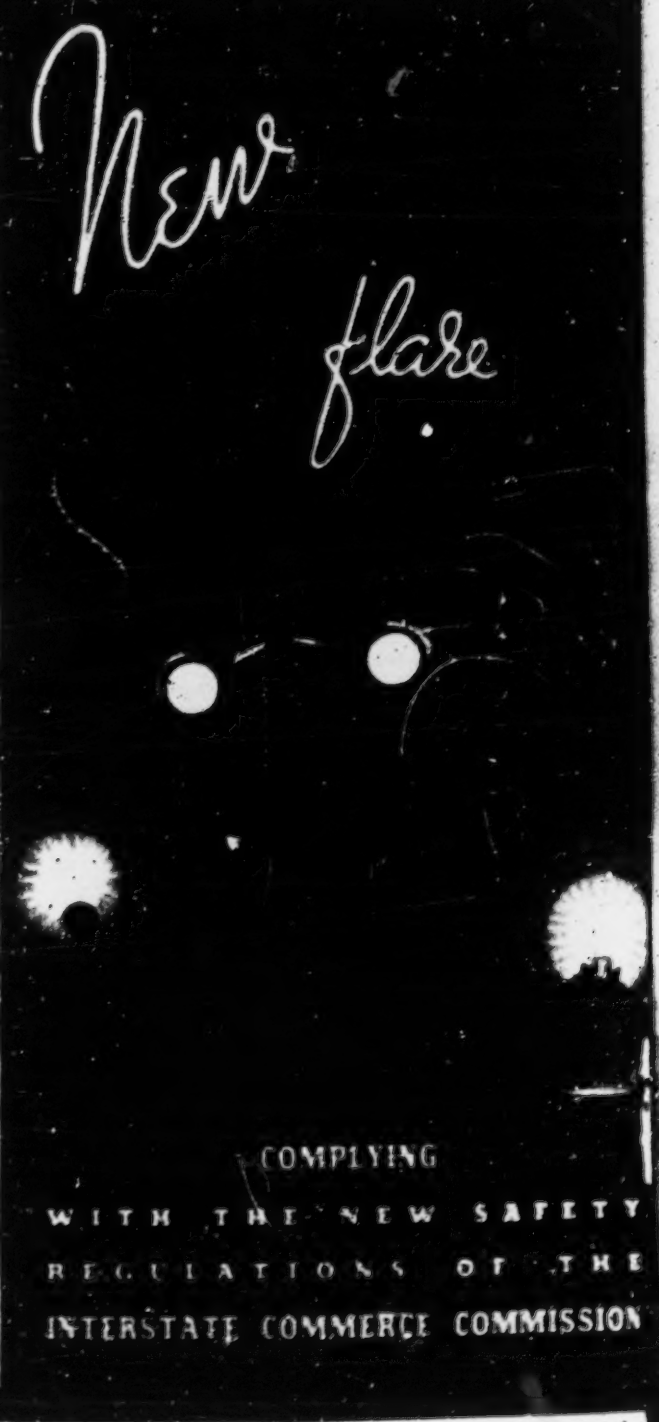
No. 5. Single TOLEDO Trunk Flare only, capacity 48 oz., burns 16 hours or more on one filling; 20 gauge steel; provided with seal-tight shutter cap; red enamel finish.

No. 715A—Red flag and staff to use in socket on cap to flare.

No. 30—30 minute red burning fusee.

No. 775—Steel Case only, equipped with brackets to hold fusee tray, hinged cover, spring lock and handle.

No. 537—Complete combination set, composed of steel container, three oil flares, three flags and staffs and one tray holding five 30 minute fusees. Shipping weight 18 lbs.


New
flare
COMPLYING
WITH THE NEW SAFETY
REGULATIONS OF THE
INTERSTATE COMMERCE COMMISSION

How to Operate Number 5 TOLEDO TRUCK FLARES

Equipped with the ECONOMY BURNER

Read Directions Carefully

The No. 5 Toledo Truck Flare consists of four principal parts; the shell or reservoir for the oil; the wick and wick holder assembly; the hood, which is perforated with four small round holes (air ports), and four large oblong holes (flame ports); and the snuffer cap.

The flares are contained in a steel case that fully encloses them and is proportioned so that the flares will fit the case in any position. In either horizontal position the flares are carried side by side. In the vertical position the flares are carried on top of each other—always right side up.



Flare No. 5 Complete

To attach the case to the vehicle, knock-out the four attachment holes in the bottom and fasten the case to the vehicle in the desired position by means of screws or bolts.

To put the No. 5 Toledo Truck Flare into operation:

1. *Remove the Snuffer Cap.*

A slight twist to the left will release the bayonet lock attachment. The gasket in the snuffer cap seals in the oil against leakage. The cap will not lock without the gasket. Do not disturb the gasket.

2. *Remove the Hood and Wick-holder with Wick.*

The hood is attached to the shell with a threaded joint. Remove the wick and wick-holder by grasping the top of the wick.

3. *Fill the Reservoir with Good Kerosene.*

The flare reservoir has a capacity of 48 ounces when filled to within a quarter of an inch of the center hole level. This will give about sixteen hours of continuous burning service under average conditions.

4. *The Wick Should Project About ⅛ of an Inch.*

The flange end of the wick-holder is the top end. The tube end projects downward into the reservoir. For best operation and longest service per filling, the wick should extend above the flange only about ⅛ of an inch. A prong in the wick tube prevents downward movement of the wick. If the wick extends too far above the flange, pull the wick through the wick-holder from the top side and thread it through the bottom end again to the proper adjustment.



Cap

5. *Insert the Wick into the Flare Reservoir.*

When wicks are new they are stiff and the wick-holder flange must be forced down to a seat. After use this condition will be corrected. Do not twist the wick in the reservoir to secure a seat for the wick-holder as this may disturb the wick adjustment.

6. *Attach the Hood.*

Screw the hood down tightly against the wick-holder flange. A lead of 1/20 of an inch is provided in the thread to give good leverage and insure a tight contact between the hood and wick-holder. Be careful not to jam or cross the thread.

7. *Ignite the Oil on the Wick Through a Flame Port.*

The Toledo Truck Flare operates on a heat reflection and vaporization principle. Be sure that the burner parts are fully heated before leaving the flare after lighting. When properly heated the burner will function without further attention, regardless of weather conditions.



Detail Showing Top of Flare

8. *To Extinguish the Flame Use the Snuffer Cap.*

Dropping the snuffer cap over the hood will extinguish the flame. Lock the snuffer cap tightly in position by a right hand twist and the contents will be securely sealed against leakage while being carried.

9. *Clean Off the Carbon.*

In normal operation a deposit of carbon will occur on the hood, wick, and wick-holder. This carbon should be cleaned off before the next period of use. This can most thoroughly be accomplished by removing the hood and wiping the parts, including the tip of the wick. Keep the air ports clear of carbon.

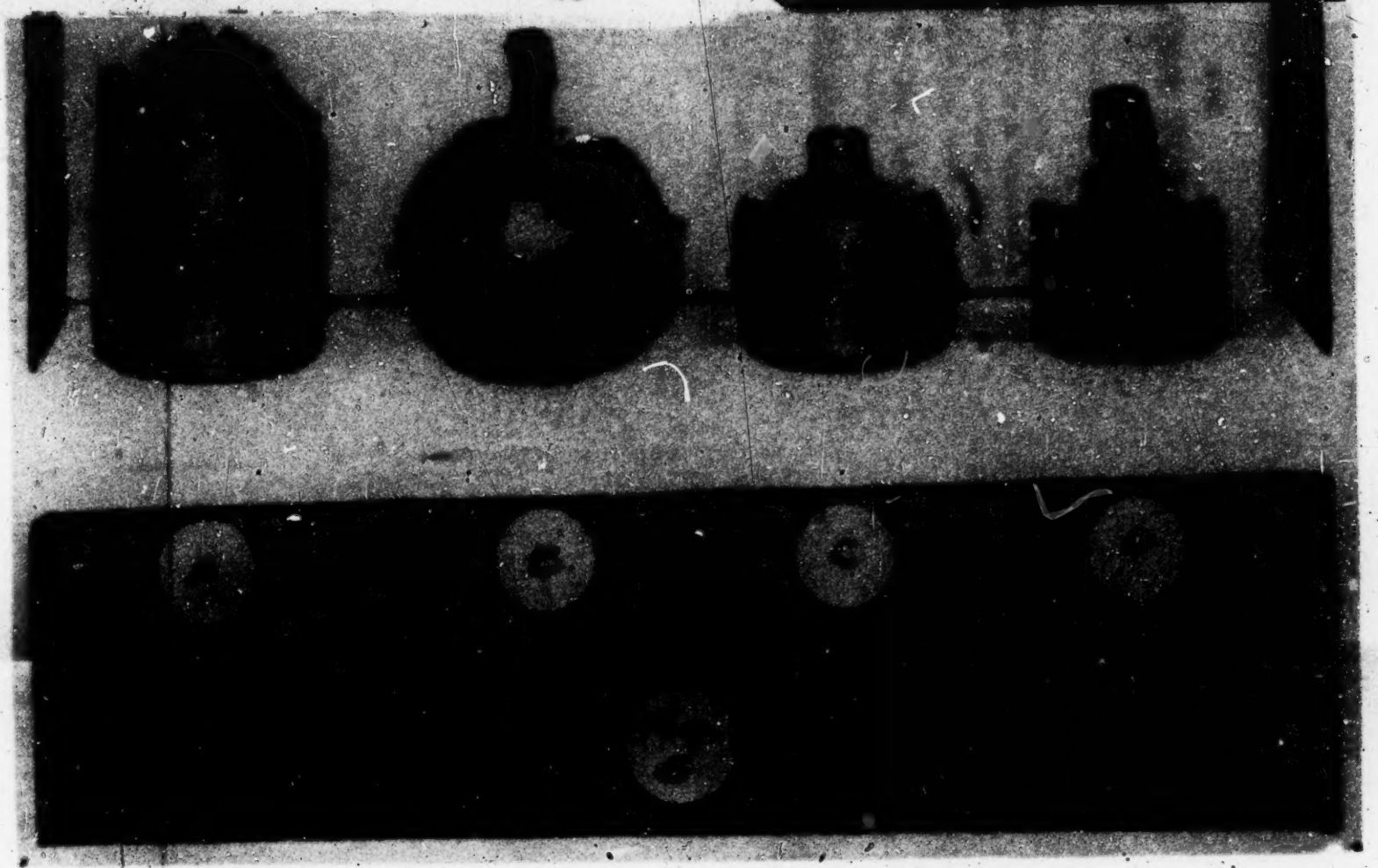
In refilling the flare, it is good practice to blow off bits of carbon that may rest on top of the wick-holder, before uncovering the reservoir. This is to prevent contaminating the oil and clogging the wick. It is also good practice now and then, when refilling, to first empty the flare completely of its contents to get rid of water and other residue which may remain from the oil which has been used.

The Toledo Pressed Steel Company · Toledo, Ohio

U.S. District Court E.D.N.Y.
Docket 5447.
Plaintiff's Exhibit 8
Filed 3/15/57

PLAINTIFF'S EXHIBIT NO. 8

PHOTO OF TORCHES AND FLAMES REFERRED TO IN EXHIBIT 14.
(A) DETROIT 3-JACK TORCH.
(B) FIRST TOLEDO OPEN-FLAME TORCH.
(C) TOLEDO TRUCK FLAME OF PATENT IN SUIT.
(D) ANOTHER TRUCK FLAME.



261

THE

TOLEDO TORCH

The only real protection for open construction work at night.

The minimum protection required by law (red lanterns) is not sufficient to keep you out of personal injury suits. But—

YOU ARE SAFE
with

THE TOLEDO TORCH

Note the sturdy, substantial construction. Rigid pressed steel with a cast iron weight welded into the bottom—it is always self-righting. No matter how it is kicked or tumbled about, like a cat it always lands right side up.



Nothing to break; so distinctive it will never be stolen. The use of

THE TOLEDO TORCH

eliminates a big and constant item of expense.

Simple to operate, no globes to clean. Just fill with kerosene and light. Put TOLEDO TORCHES around the open work or in the holes you leave. No barricades are needed.

No one can mistake the warning of this signal. Its ruddy flame is seen from a greater distance, it instantly attracts attention. The TOLEDO TORCH gives enough light to see all the danger.

Seven inches in diameter, holds seven-tenths of a gallon of kerosene. The TOLEDO TORCH will burn all night anywhere, at any time, in any kind of weather. It is an all-purpose danger signal.

Used by state and county highway departments, cities, public utilities, road builders and progressive contractors—everywhere. To them The Toledo Torch has proven the economical solution of a troublesome and expensive problem.

266

Jan. 11, 1927. 1,613,819

L. W. CLOSE

TORCH

Filed August 6, 1926

Fig. 1.

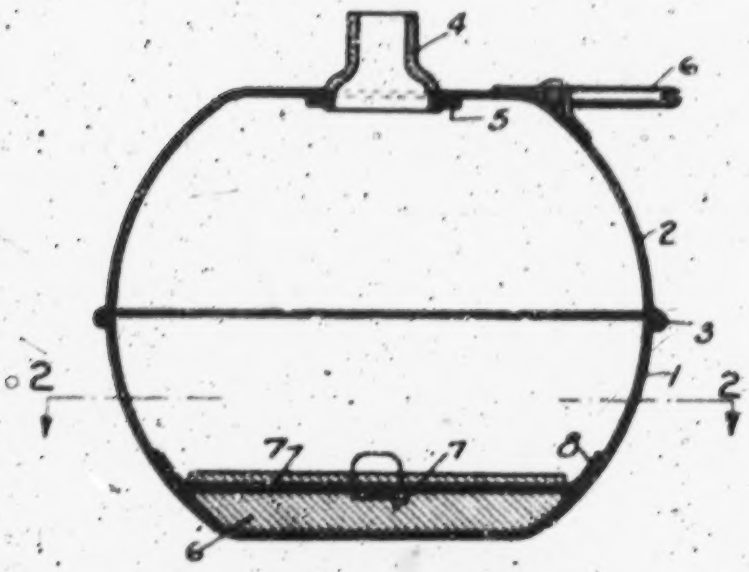


Fig 2.

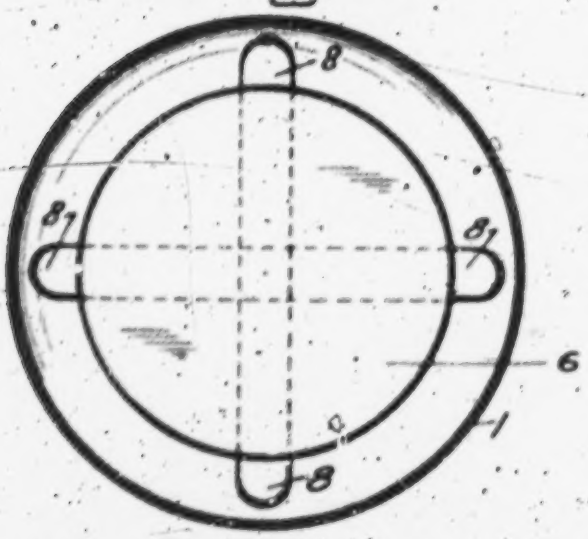
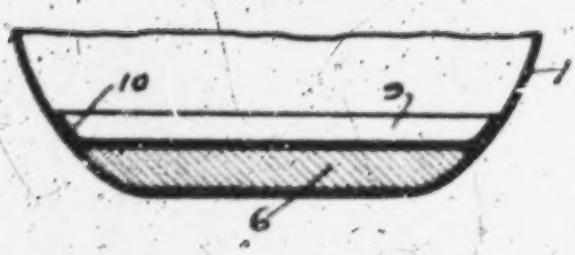


Fig. 3.



INVENTOR

BY Lyman W. Close

Owen & Owen

ATTORNEYS

1,613,819

Patented Jan. 11, 1927.

UNITED STATES PATENT OFFICE.

LYMAN W. CLOSE, OF TOLEDO, OHIO, ASSIGNOR TO THE TOLEDO PRESSED STEEL COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

TORCH.

Application filed August 6, 1926. Serial No. 127,698.

This invention relates to torches but more particularly to torches of the type used in connection with road repair or construction work for danger signals, and an object of this invention is to provide a torch with a counter weight for maintaining the torch in upright position which is mounted in the torch body in a simple and efficient manner enabling such counter weight to be fixedly secured in place readily and cheaply. Further objects and advantages will hereinafter appear.

The invention is shown by way of illustration in the accompanying drawings, in which—

Fig. 1 is a vertical sectional elevation of a torch embodying the invention; Figure 2 is a section on the line 2—2 of Figure 1; and Figure 3 is a detail sectional elevation of an alternate form.

The illustrated embodiment of the invention comprises a torch of sheet metal having a body portion formed of two parts, a base part 1 and an upper part 2. The bottom and top of the torch body are flattened and the side walls are rounded. In this instance, the adjoining edges of the top and bottom parts are seamed together as shown at 3. Formed centrally in the top of the upper part is an opening into which fits a spout or nozzle 4 screwed into a ring 5 spot welded to the inside of the torch body. A handle ring 6 may be suitably connected to the side of the torch to facilitate handling.

In torches of this character, it is highly desirable to proride a counter weight so that at all times an upright position is maintained and so that the torches are self-righting should they be knocked over. As shown a counter weight 6 is placed in the bottom of the torch body and is shaped to conform to the side walls of the torch body.

For securely holding the counter weight in place a pair of straps 7 spot welded together is embodied in the counter weight with the ends 8 projecting therefrom. The counter weight 6 may be cast around the straps so that a unitary arrangement is formed. The projecting ends 8 of the strap are bent upwardly to lie flat against the inner wall of the torch body. These ends are preferably spot welded to the torch so that the counter weight 6 is fixedly secured in place.

In the alternate form shown in Figure 2, the counter weight 6^a is similar in shape to the counter weight 6, but instead of utilizing straps to hold it in place, a cup-shaped member 9 rests against the top of the counter weight and has its edge portions 10 bent to conform to the inner wall of the torch body. The edge portions are spot welded at intervals to the torch so that relative movement between the counter weight 6^a and torch body is prevented.

While I have described my improved torch in more or less detail to comply with the requirements of this statute, it is nevertheless desired that this detailed description be considered merely as illustrative and not as limiting, and it is to be understood that changes and modifications may be made by those skilled in this art without departing from the invention as defined in the following claims.

What I claim is:

1. A torch comprising a body having a flat base and curved walls, a counter weight inside of said body and conforming to the side walls thereof, holding means extending across the upper portion of said counter weight, and upwardly bent end portions on said holding means to conform to the inside of said body, said upwardly bent portions being rigidly secured to the inside of said body thereby to hold said counter weight against movement.

2. A torch comprising a two part body, the lower part having a flat base and curved side walls, the upper part having curved side walls and a flat top, a seam connecting said parts together, a nozzle in the top of said upper part, a counter weight in said lower part having sides conforming to the shape of the side walls of the body, straps embedded in said counter weight, and upwardly bent end portions on said straps projecting beyond the ends of said counter weight and lying flat against the body, said bent end portions being secured to said body.

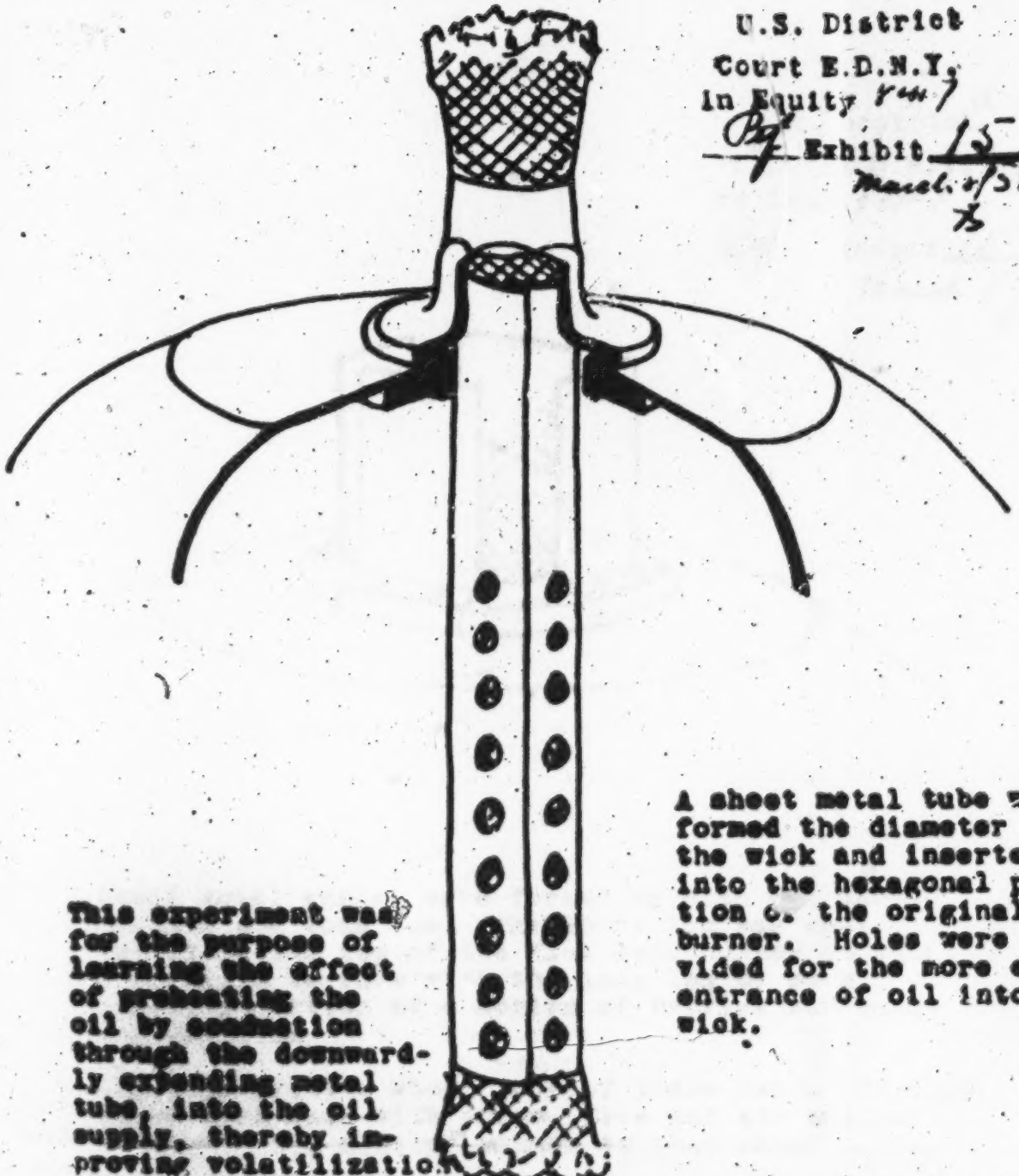
3. A torch comprising a two part body, the lower part having a flat base and curved side walls, the upper part having curved side walls and a flat top, a seam connecting said

parts together, a nozzle in the top of said upper part, a counter weight in said lower part having sides conforming to the shape of the side walls of the body, a retaining member engaging the upper portion of said counter weight and upwardly bent edges on said member conforming to the shape of the inner walls of said body, said upwardly bent edges being rigidly secured to said body thereby to retain said counter weight in place.

In testimony whereof I have hereunto signed my name to this specification.

LYMAN W. CLOSE.

U.S. District
Court E.D.N.Y.
In Equity
Pltf Exhibit
Marked

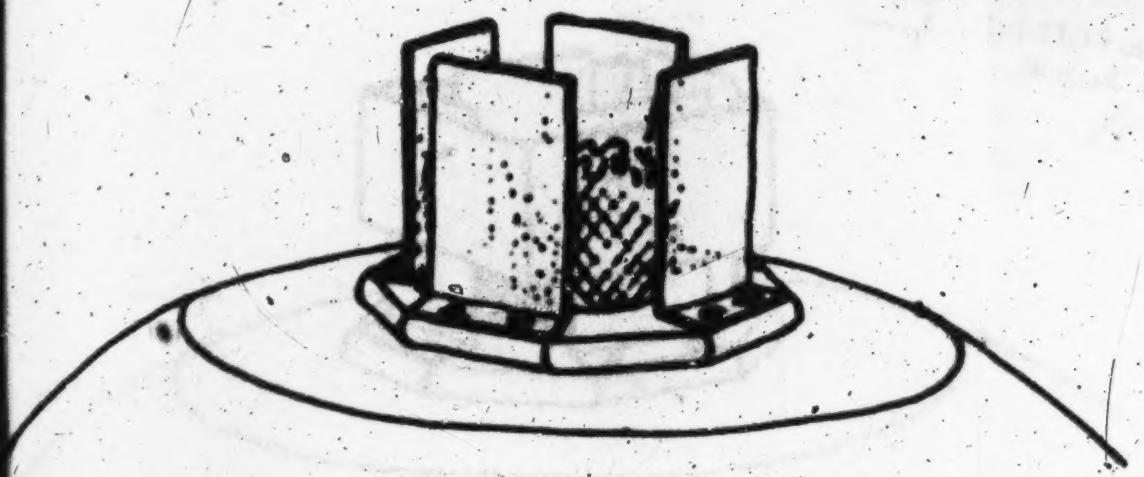


A sheet metal tube was formed the diameter of the wick and inserted into the hexagonal portion of the original burner. Holes were provided for the more easy entrance of oil into the wick.

This experiment was for the purpose of learning the effect of preheating the oil by conduction through the downwardly expanding metal tube, into the oil supply, thereby improving volatilization and consequently improving combustion and making the flame more reliable in cold and windy weather.

It had merit but was impractical to produce.
This taught us that preheating oil was desirable.

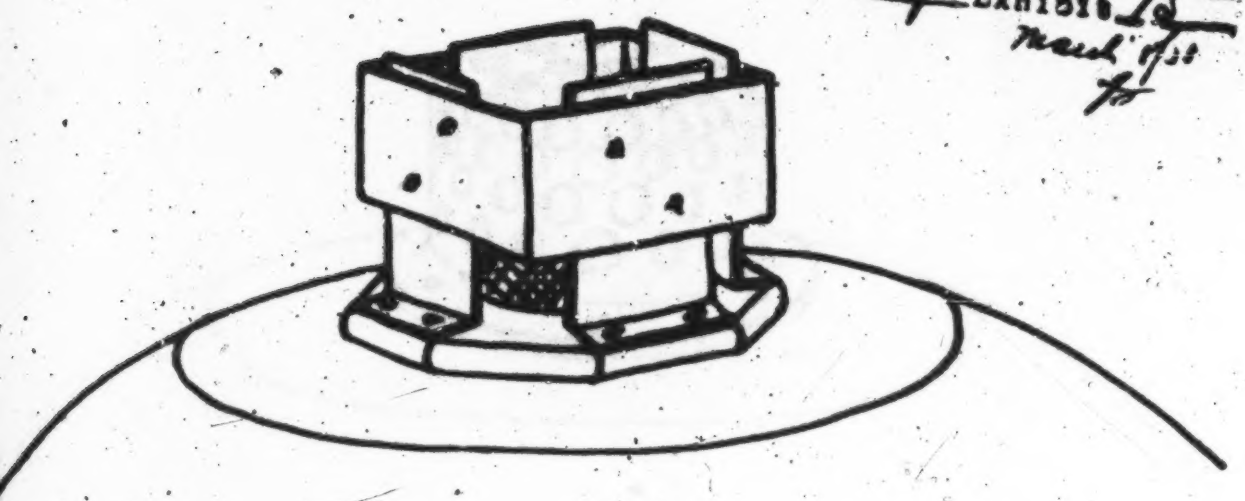
U.S. District Court E.D.N.Y.
In Equity 8417
Pltf Exhibit 15a
Marked 9/57
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Sheet metal angles were formed up with one short leg and one long one. The short leg was spot welded to the top of the flat type burner in such a position to form with the long leg of each angle, a portion of a series of baffles surrounding the wick

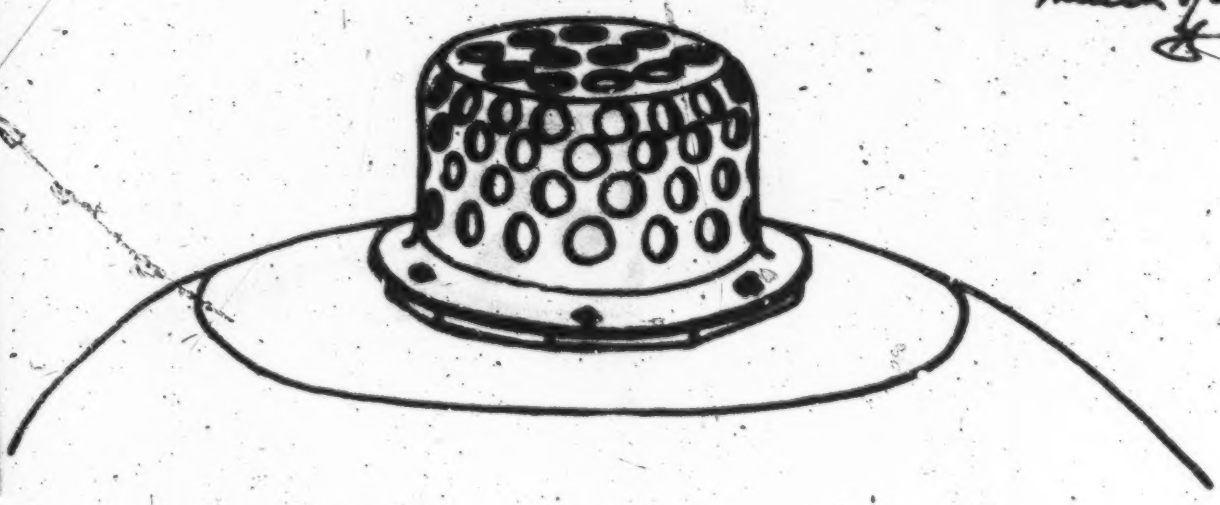
The illustration shows four of these used. Similar tests were made with three, five and six angles arranged in a similar manner to that shown above.

2
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Court E.D.N.Y.
In Equity 8417
Exhibit 15
Mark for ID



To prevent the easy extinguishing of the flame by the wind when simply straight pieces of metal were placed about the wick, a band around them was tried out. It was an improvement but not practical to make.

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Court E.D.N.Y.
In Equity 9417
Exhibit 15
March 9/31

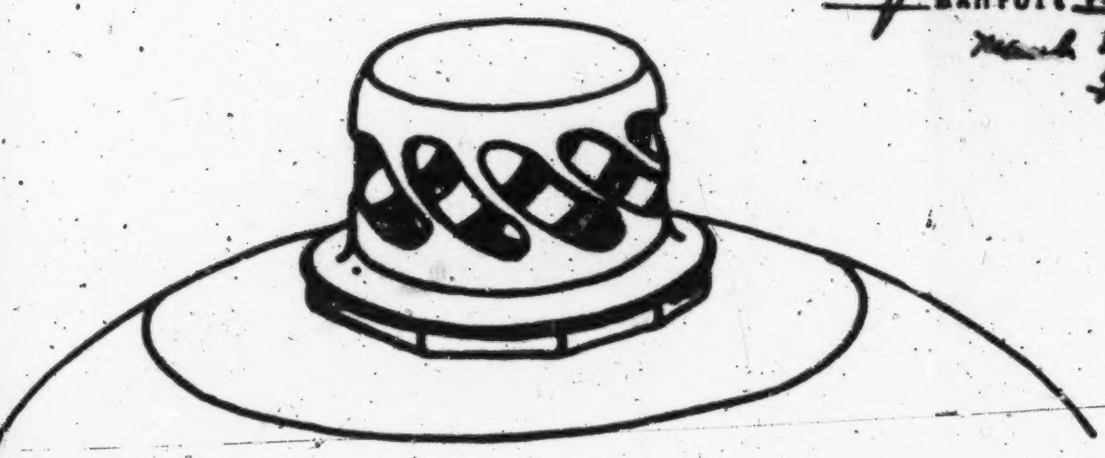


A cap was made of suitable size to fasten to the top of the flat type burner and was drilled full of holes as shown.

Tests proved the merit of enclosing the wick in such a manner but further improvement was necessary to improve ability to withstand rain and wind.

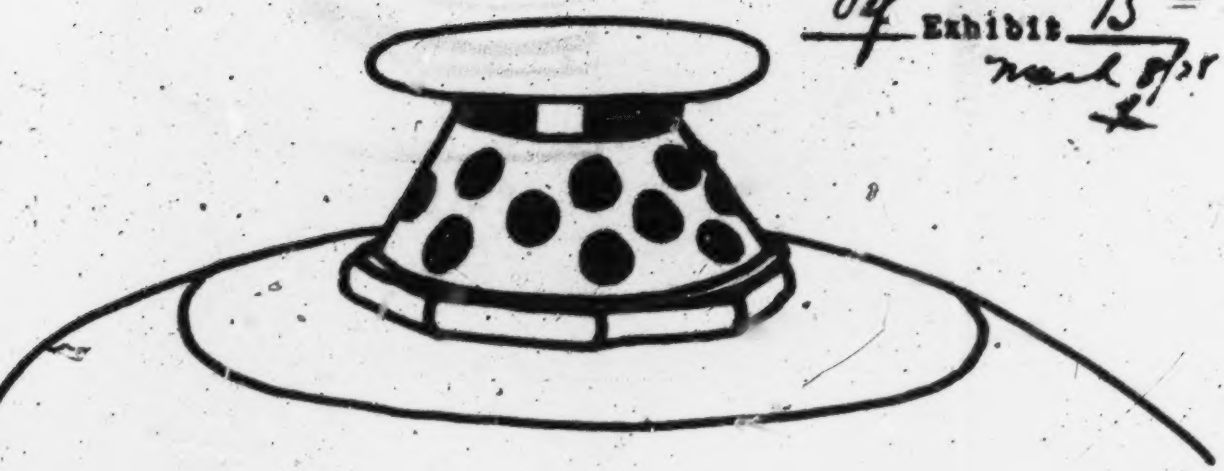
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Court E.D.N.Y.
In Equity 5417
Exhibit 15 E



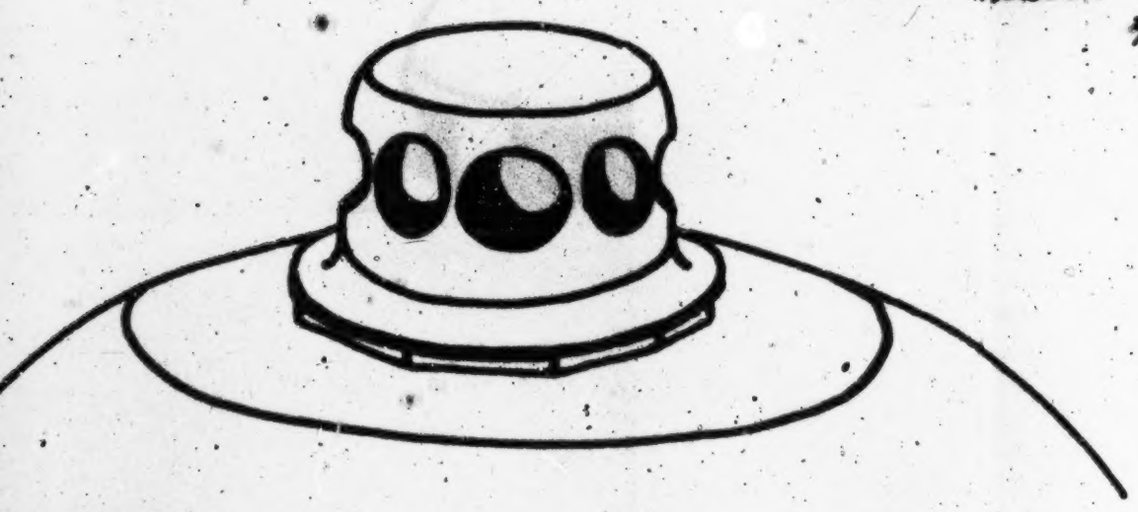
Many caps of shape similar to that shown above were constructed, using different arrangements of perforations and slots in an effort to secure the best results.

U.S. District
Court E.D.N.Y.
In Equity 947
Exhibit 15 D



A tapered shell with perforations of several different arrangements was covered by a flat disc attached to it to fend off rain.

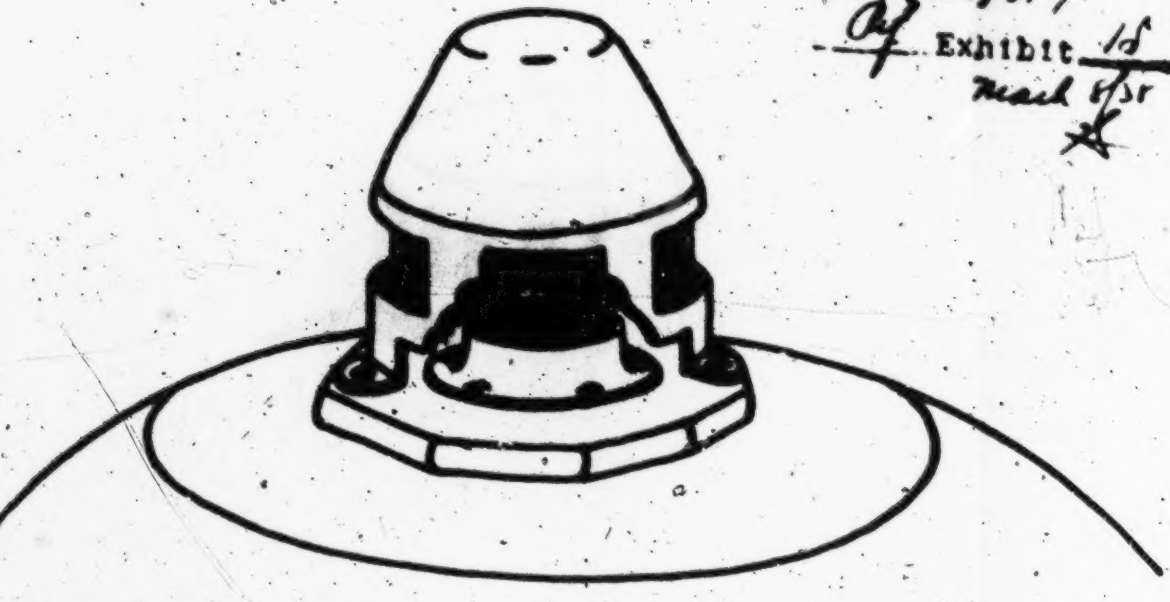
U.S. District
Court E.D.N.Y.
In Equity 417
Def Exhibit 15 F
March - 1938



Drilled holes in many different arrangements were experimented with, in addition to sawed and filed slots.

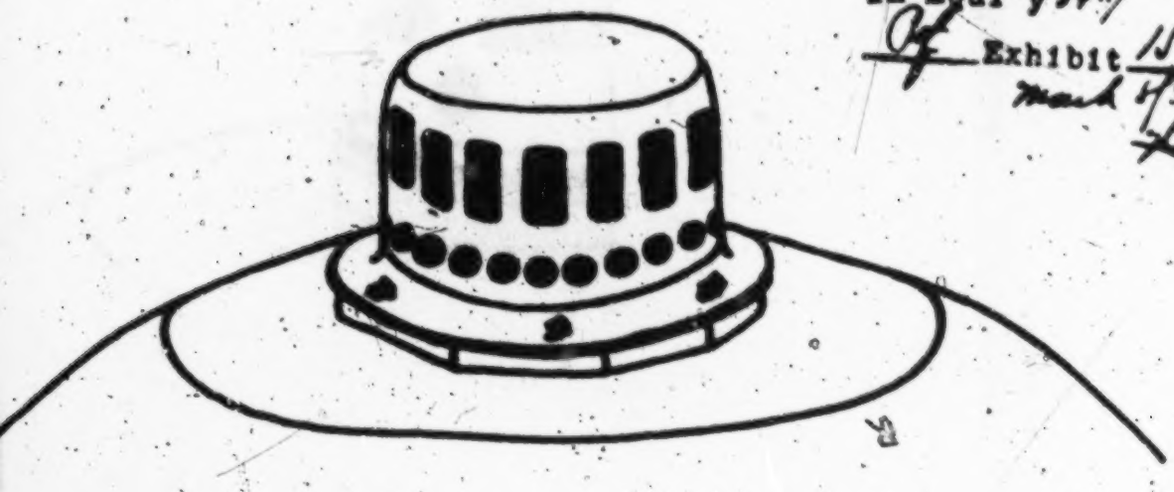
10

U.S. District
Court E.D.N.Y.
In Equity 8417
Exhibit 15 G
Neal 4/31



The cutaway section shows the wick holder collar which was introduced as secondary protection inside the shell for the wick. Previous tests were repeated with a wick holder of this sort used in addition to the outer shells.

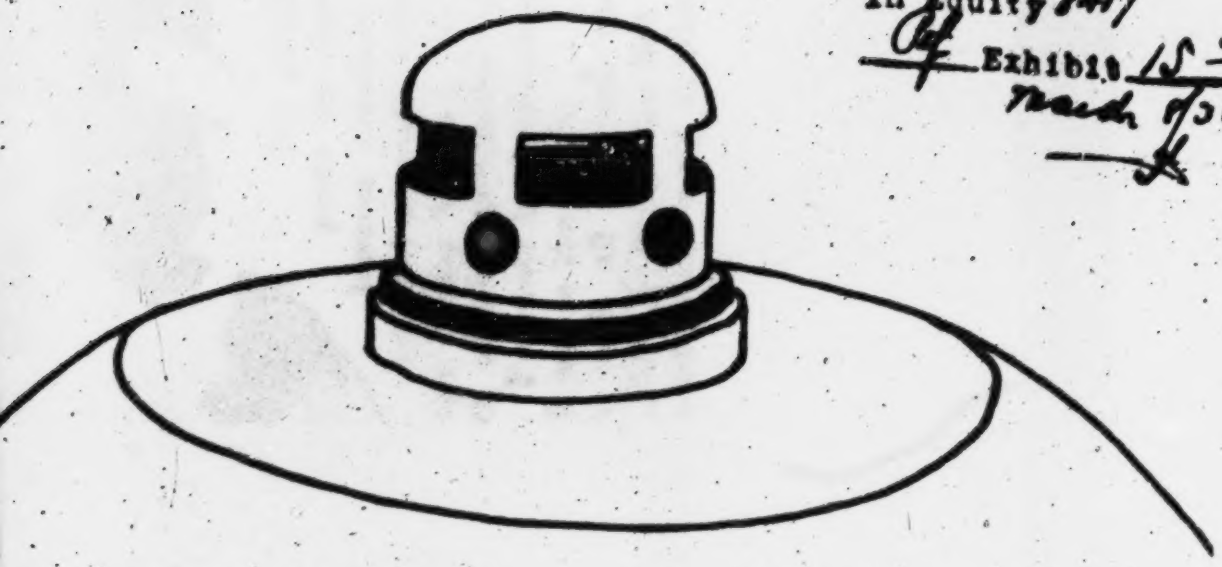
U.S. District
Court E.D.N.Y.
In Equity 44
Exhibit 15 H
Marked 4/5/



The results previously obtained led to a consistent series of experiments with various arrangements of lower holes for the entrance of air and upper holes for the exit of the flame, and the use of a wick holder inside, adjusted at various heights.

1

U.S. District Court E.D.N.Y.
In Equity 8417
Def Exhibit 15 1
March 7/31
[illegible]



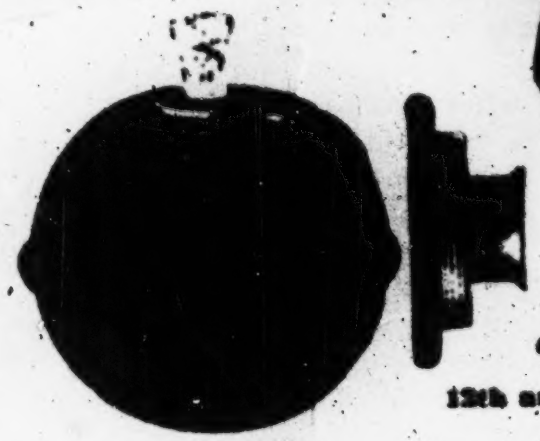
To facilitate better application of wick holder and make possible more consistent results, a screw collar and hood were turned up out of copper in substantially the shape and size shown above. Subsequent hoods turned up out of steel with various arrangements of holes and heights of wick holder resulted in the design and proportions of the present Economy Burner.

A New Feature in an Old Stand-by









TOLEDO TORCHES are now equipped with a NEW BURNER which greatly improves their serviceability.

No Price Change!

Just more for the money.

No projecting parts to damage. Insures constant flow of fuel at right temperature in any weather. Correct length of wick projection always assured. Prevents back-slippage and loss of wick inside the torch. Interchangeable with all previous models. Makes THE TOLEDO TORCH the last word in protection of construction work at night.

THE TOLEDO PRESSED STEEL CO.

12th and Woodruff Toledo, Ohio



Greater Protection at Lower Cost

Storm-proof Theft-proof Reliable Safe

To present users of

TOLEDO TORCHES:

Your old torches may be equipped with new burners. Ask your dealer or write us direct.



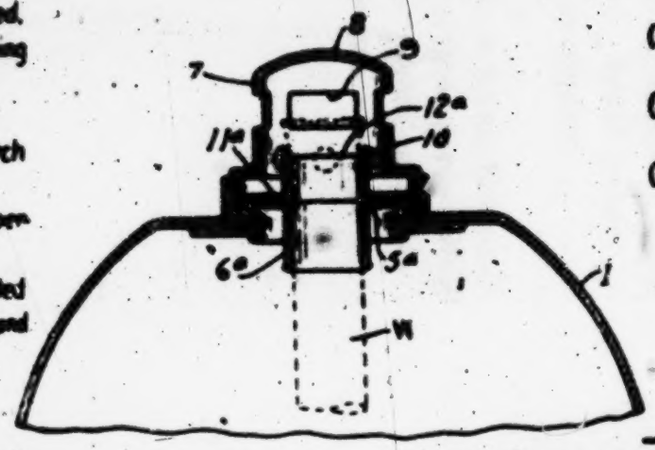
PLAINTIFF'S EXHIBIT No. 16.

289

CLAIM 2

2. In a device of the class described,
(A) a torch body (1) having an opening for a wick (W), and
(B) a flame guard for said wick mounted on the outside of said torch body, said guard including
(1) a cap (7) provided with an imperforate top wall (8) and
(2) lateral flame openings (9) adapted to emit a luminescent flame and
(3) air ports (10).

FIG. 3 OF PATENT IN SUIT



CLAIM 5

5. In a device of the class described
(A) a construction torch having an opening in its upper end for a wick (W),
(B) means (5a, 6a and 12a) to hold the wick in place, and
(C) a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having
(1) an imperforate top wall (8) and
(2) side flame (openings 9) and
(3) air openings (10).

CLAIM 11

11. A burner for a construction torch adapted to emit a luminescent flame and comprising
(A) a wick holder (5a, 6a and 12a) having
(1) a portion in contact with the wick and
(2) a supporting and heat-receiving flange (5a, 11a) and
(B) means enclosing a space above said flange and surrounding the wick except for provision for lateral exit of flame (9) and restricted entrance of air for combustion (10).

CLAIM 12

12. A burner for a construction torch adapted to emit a luminescent flame and comprising
(A) a wick holder having
(1) a portion (6a, 12a) in contact with the wick and
(2) a lateral flange (5a, 11a) and
(B) a cap (7) enclosing and spaced from the end of the wick and having an imperforate top and
(C) provision for lateral exit of flame (9) and
(D) (provision for) entrance of air (10), and
(E) the bottom of the cap being in heat conducting relation to said flange.

Plaintiff's Exhibit 24

Plaintiff's Exhibit 24 877
March 8, 1938

TEST RUN ON ROOF OF OUR BUILDING
FROM 8:25 A. M. TO 5:05 P. M.,
4/12/35

Each torch was filled and adjusted in the manner recommended for practical use under weather conditions.

#1 Using old style open flame burner:
At beginning of period weight..9 lbs., 11 oz.
At end of period weight.....7 lbs., 10 oz. 878
Oil Consumption .....2 lbs., 1 oz.

#2 Truck Flare using Economy Burner:
At beginning of period weight..4 lbs., 3 oz.
At end of period weight.....3 lbs., 1 oz.
Oil Consumption .....1 lb., 2 oz.

TEST RUN ON ROOF OF OUR BUILDING
FROM 8:00 A. M. TO 5:30 P. M.,
4/15/35

Each torch was filled and adjusted in the manner recommended for practical use under weather conditions. 879

#1 Toledo Torch using old style open flame burner:
At beginning of period weight..9 lbs., 12 oz.
At end of period weight.....6 lbs., 15 oz.
Oil Consumption .....2 lbs., 13 oz.

#2 Truck Flare using Economy Burners:
At beginning of period weight..4 lbs., 2 oz.
At end of period weight.....3 lbs., 0 oz.
Oil Consumption .....1 lb., 2 oz.

Plaintiff's Exhibit 24

880 TEST RUN ON ROOF OF OUR BUILDING
FROM 8:45 A. M. TO 6:00 P. M.,
4/16/35

Each torch was filled and adjusted in the manner recommended for practical use under weather conditions.

#1 Toledo Torch using old style open flame burner:

At beginning of period weight..9 lbs., 13 oz.
At end of period weight.....6 lbs., 15 oz.
Oil Consumption .....2 lbs., 14 oz.

881

#2 Truck Flare using Economy Burner:

At beginning of period weight.4 lbs., 4 oz.
At end of period weight.....3 lbs., 4 oz.
Oil Consumption .....1 lb., 0 oz.

TEST RUN ON ROOF OF OUR BUILDING
FROM 8:30 A. M. TO 5:30 P. M.,
4/17/35

Each torch was filled and adjusted in the manner recommended for practical use under weather
882 conditions.

#1 Toledo Torch using old style open flame burner:

At beginning of period weight..9 lbs., 13 oz.
At end of period weight.....6 lbs., 15 oz.
Oil Consumption .....2 lbs., 14 oz.

#2 Truck Flare using Economy Burner:

At beginning of period weight..4 lbs., 4 oz.
At end of period weight.....3 lbs., 2 oz.
Oil Consumption .....1 lb., 2 oz.

Plaintiff's Exhibit 24

TEST RUN ON ROOF OF OUR BUILDING 883
FROM 8:10 A. M. TO 5:30 P. M.,
4/18/35

Each torch was filled and adjusted in the manner recommended for practical use under weather conditions.

#1 Toledo Torch using old style open flame burner:

At beginning of period weight..9 lbs., 13 oz.
At end of period weight.....6 lbs., 14 oz.
Oil Consumption .....2 lbs., 15 oz.

884

#2 Truck Flare using Economy Burner:

At beginning of period weight..4 lbs., 3 oz.
At end of period weight.....3 lbs., 0 oz.
Oil Consumption .....1 lb., 3 oz.

TEST RUN ON ROOF OF OUR BUILDING
FROM 8:40 A. M. TO 5:20 P. M.,
4/19/35

Each torch was filled and adjusted in the manner recommended for practical use under weather conditions. 885

#1 Toledo Torch using old style open flame burner:

At beginning of period weight..9 lbs., 13 oz.
At end of period weight.....6 lbs., 9 oz.
Oil Consumption .....3 lbs., 4 oz.

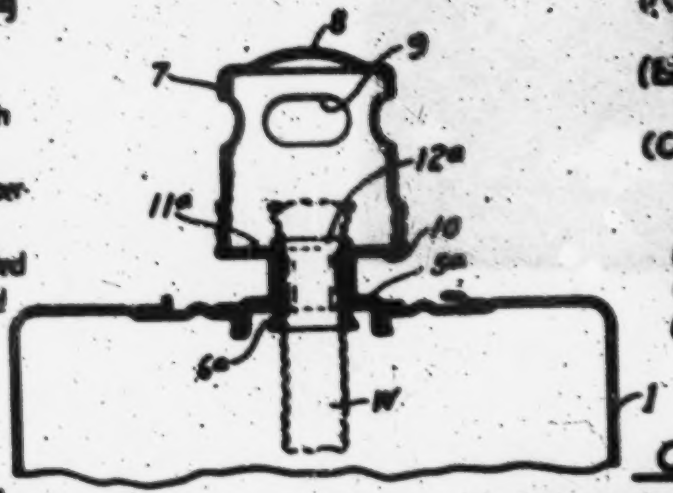
#2 Truck Flare using Economy Burner:

At beginning of period weight..4 lbs., 2 oz.
At end of period weight.....2 lbs., 11 oz.
Oil Consumption .....1 lb., 7 oz.

Averages: #1—4.94 oz. per hour.
#2—2.06 oz. per hour.

E.D. Virginia
Case E.D.V.T.
In Equity No.
Exhibit 25

DEFENDANT'S FLARE (ANTHES)



CLAIM 2

2 In a device of the class described,
(A) a torch body (1) having an opening for a wick (W), and
(B) a flame guard for said wick mounted on the outside of said torch body, said guard including
(1) a cap (7) provided with an imperforate top wall (8) and
(2) lateral flame openings (9) adapted to emit a luminescent flame, and
(3) air ports (10).

CLAIM 5

5. In a device of the class described,
(A) a construction torch having an opening in it's upper end for a wick (W),
(B) means (5a, 6a and 12a) to hold the wick in place, and
(C) a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having
(1) an imperforate top wall (8), and
(2) side flame openings 9, and
(3) air openings (10).

CLAIM 11

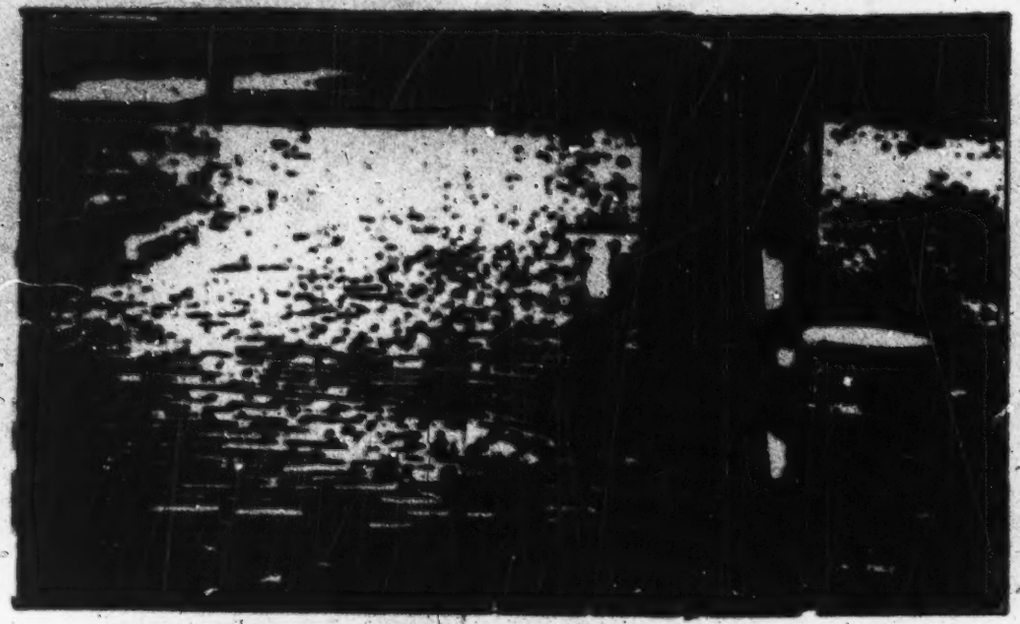
11 A burner for a construction torch adapted to emit a luminescent flame and comprising
(A) a wick holder (5a, 6a and 12a) having
(1) a portion in contact with the wick and
(2) a supporting and heat-receiving flange (5a, 11a), and
(B) means enclosing a space above said flange and surrounding the wick except for provision for lateral exit of flame (9) and restricted entrance of air for combustion (10).

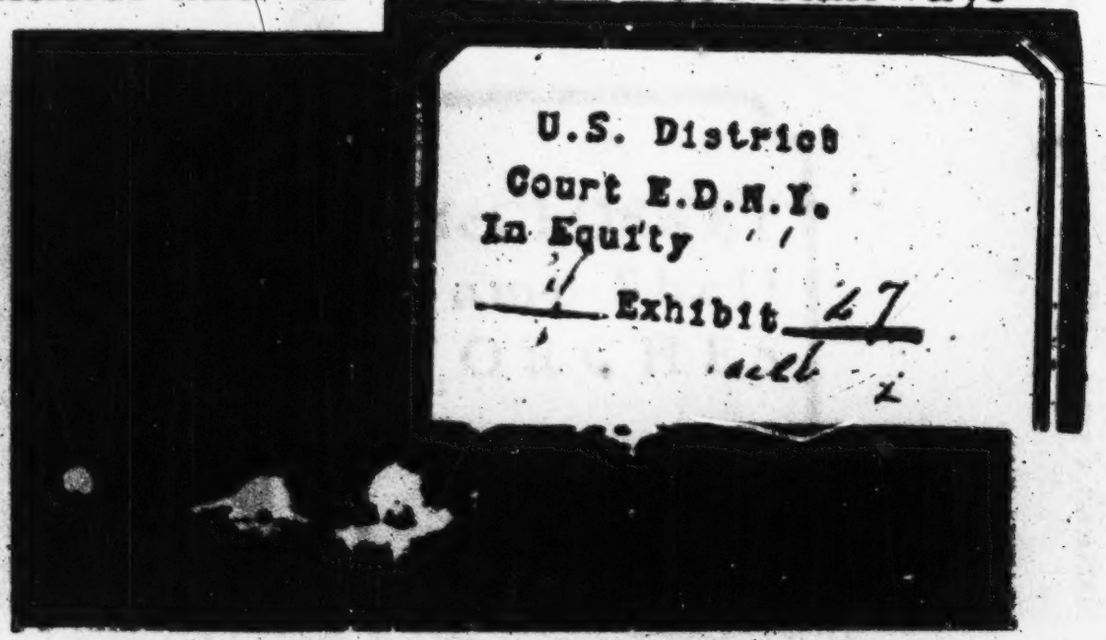
CLAIM 12

12. A burner for a construction torch adapted to emit a luminescent flame and comprising
(A) a wick holder having
(1) a portion (6a, 12a) in contact with the wick and
(2) a lateral flange (5a, 11a), and
(B) a cap (7) enclosing and spaced from the end of the wick and having an imperforate top and
(C) provision for lateral exit of flame (9) and
(D) (provision for) entrance of air (10), and
(E) the bottom of the cap being in heat conducting relation to said flange.

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McCloskey Bomb Shell Torch as a Sentinel and in Use by Street Railways





U.S. District
Court E.D.N.Y.
In Equity
Exhibit 47

McCloskey Torch No 1
4 quart capacity will burn 48 hours.

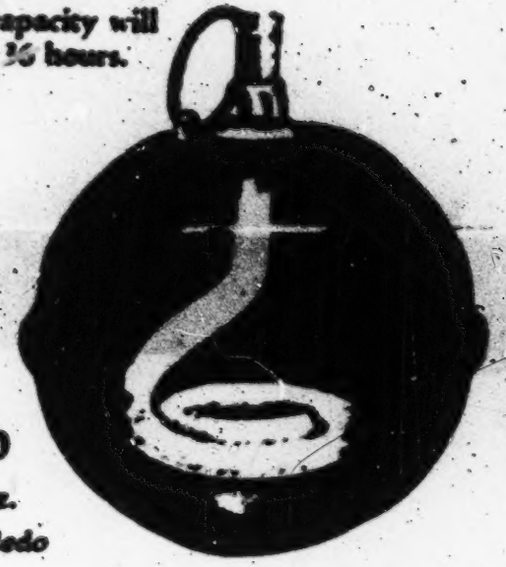


$35.00
per doz.
f. o. b. Toledo

McCloskey Torches are used exclusively by city public works, county and state highway commissioners, electric and steam railroads, the United States Department of Agriculture and many of them are shipped abroad.

Users of McCloskey Torches have reduced accident claims nearly 100 per cent. McCloskey Torches remain lighted during the hardest wind and rain storms—they stay on the job where other warning signals fail. Easily carried by special handle.

McCloskey Torch No. 2
3 quart capacity will burn 36 hours.



$24.00
per doz.
f. o. b. Toledo

692



How the Toledo City Water Department uses McCloskey Bomb Shell Torches

How the Toledo City Water Department uses McCloskey Bomb Shell Torches. *McCLOSKEY* Torches are made in two halves, of rolled and pickled deep drawn steel and welded together. Sufficient cast iron counter balance pressed in the bottom absolutely prevents them from being knocked over.

McCLOSKEY Torches will burn from Saturday night until Monday morning, with just one filling. No barricading is necessary.

McCLOSKEY Torches are never stolen—they are suitable for construction work only.

McCLOSKEY Bomb Shell Torches are equipped with wick and are ready for instant use. Note exclusive design, sturdiness and adaptability.

McCLOSKEY Bomb Shell TORCHES

PATENTED

December 14. 1926

Manufactured and Sold By



PLAINTIFF'S EXHIBIT No. 27

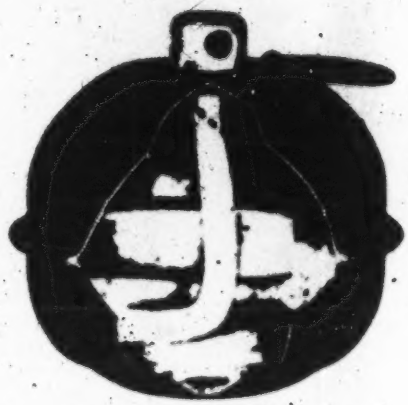
301

McCLOSKEY
BOMB SHELL TORCH

• • •

"The Best Danger Signal"

- UNBREAKABLE
- ECONOMICAL
- RELIABLE
- LEAK-PROOF
- EFFICIENT
- CYCLONE BURNER

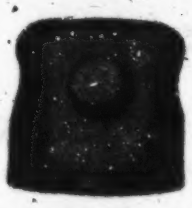


Specified by State Officials
The U. S. Department of Agriculture

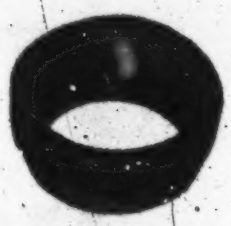
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McCLOSKEY TORCH CO.

1215 West Bancroft Street
TOLEDO, OHIO, U. S. A.



Cyclone Burner



Adapter for Torches Shielded



Wick Holder

Torches now being used without Cyclone Burners may be easily equipped with this wonderful improvement by means of our adapter and wick holder shown above.

Price List

(Standard Package Lots)

No. 1	Large	4 quart capacity, 13 Gauge Steel	$35.00 per dozen
No. 2	Small	3 quart capacity, 15 Gauge Steel	24.00 per dozen
No. 3	Flat Bottom	1½ quart capacity, 15 Gauge Steel	18.00 per dozen
Kits—	Container and three No. 3 burners		6.50 per kit
Container only			1.75 each
Cotton Wicks			1.75 per dozen
Cyclone Burner Caps			2.00 per dozen
Wick Holders			1.20 per dozen
Adapters			2.40 per dozen

Prices are subject to change without notice

Standard Packages

No. 1	Three in carton	Shipping weight	20 pounds
No. 2	Six in carton	Shipping weight	25 pounds
No. 3	Twelve in carton	Shipping weight	25 pounds
Kit	One in carton	Shipping weight	12 pounds
Container only	One in carton	Shipping weight	4 pounds

Terms: F. O. B. Toledo, Ohio. 2% 10 days, net 30 days.



McCloskey Torch Co.

1215 W. Bancroft Street — TOLEDO, OHIO, U. S. A.

Plaintiff's Exhibit 29

Plaintiff's Exhibit 29 919
March 8, 1938

FUEL CONSUMPTION TEST

Object:

To determine the relative fuel consumption of four torches under a series of normal operating conditions.

Apparatus:

One regular Toledo Truck Flare, No. 770.

One Anthes Truck Flare purchased from Montgomery, Ward & Company at Lima, Ohio. 920

One old style open flame Toledo Torch.

One triple wick cast iron torch obtained from Detroit Street Railway Dept.

Procedure:

All torches were properly filled with kerosene, sp. gr. .7995 at 60°, flash point 135°. The wick on the Toledo Flare was set at approximately 1/8" extension as prescribed in the instruction sheet packed with each Toledo Flare. The wick on the Anthes Flare was set at approximately 1/8" extension. The wick on the old style torch was set at 1½" extension. The wick on the Detroit Torch 921 was set at ¼" extension.

Each torch was weighed on a Hanson Spring Balance and the gross weight recorded.

All torches were lighted and placed on top of the observation stand installed on the roof of the factory of The Toledo Pressed Steel Company, where they could be observed continuously from the office. The starting time was noted and recorded. At the end of the period, the torches were extinguished and reweighed. The weights were recorded, the difference between the starting

922 weight and finishing weight being the weight of fuel consumed during that period.

This procedure was followed on several consecutive days to get an average of all conditions.

Conditions:

A variety of weather conditions was encountered during the period of this test, but for the most part the conditions were just a good average of the conditions met with in usual service. Temperature ranged from freezing to several degrees above. A moderate breeze was present practically all of the time keeping all flames quite active. There were
923 occasional light flurries of fine rain. The test was conducted throughout with the wick extensions noted above.

Results:

Feb. 1st, 1938 10:25 A. M.-2:25 P. M.
(Total elapsed time 4 Hrs.)

Torch	Start Wt.	Finish Wt.	Loss	Rate Per Hr.
Toledo E. B.	4 lb.	3 lb. 9 oz.	7 oz.	1.75 oz.
Anthes	2 " 10 oz.	2 " 6 "	4 "	1.00 "
Toledo O. S.	10 " 8 "	9 " 1 "	1 lb. 7 "	5.75 "
Detroit	21 " 9 "	20 " 6 "	1 " 3 "	4.75 "

924

Feb. 2nd, 1938 8:25 A. M.-3:25 P. M.
(Total elapsed time 7 Hrs.)

Toledo E. B.	4 lb. 4 oz.	3 lb. 11 oz.	9 oz.	1.28 oz.
Anthes	2 " 6 "	1 " 11 "	11 "	1.57 "
Toledo O. S.	9 " 1 "	7 " 6 "	1 lb. 11 "	3.86 "
Detroit	21 " 7 "	19 " 13 "	1 " 10 "	3.72 "

Feb. 4th, 1938 8:30 A. M.-5:00 P. M.
(Total elapsed time 8.5 Hrs.)

Toledo E. B.	4 lb.	3 lb. 3 oz.	13 oz.	1.53 oz.
Anthes	2 " 9 "	1 " 12 "	13 "	1.53 "

Plaintiff's Exhibit 29

Toledo O. S.	10 "	3 "	7 " 13 "	2 lb. 6 "	4.70 "	925
Detroit	21 "	6 "	19 " 3 "	2 " 3 "	4.12 "	

Feb. 5th, 1938. 8:15 A. M.-3:15 P. M.
(Total elapsed time 7 Hrs.)

Toledo E. B.	3 lb. 11 oz.	2 lb. 15 oz.	12 oz.	1.72 oz.	
Anthes	2 " 10 "	1 " 12 "	14 "	2.00 "	
Toledo O. S.	10 " 1 "	8 " 6 "	1 lb. 11 "	3.86 "	
Detroit	21 " 5 "	19 " 12 "	1 " 9 "	3.58 "	

Feb. 7th, 1938 8::55 A. M.-4:50 P. M.
(Total elapsed time 7.92 Hrs.)

Toledo E. B.	4 lb. 3 oz.	3 lb. 8 oz.	11 oz.	1.39 oz.	926
Anthes	2 " 10 "	1 " 12 "	14 "	1.76 "	
Toledo O. S.	10 " 6 "	7 " 12 "	2 lb. 10 "	5.17 "	
Detroit	21 " 9 "	19 " 6 "	2 " 3 "	4.41 "	

Feb. 8th, 1938 9:30 A. M.-4:15 P. M.
(Total elapsed time 6.75 Hrs.)

Toledo E. B.	4 lb. 3 oz.	3 lb. 4 oz.	15 oz.	2.22 oz.	
Anthes	2 " 9 "	1 " 11 "	14 "	2.07 "	
Toledo O. S.	10 " 3 "	8 " 6 "	1 lb. 13 "	4.30 "	
Detroit	21 " 7 "	19 " 9 "	1 " 14 "	4.44 "	

Feb. 9th, 1938 9:55 A. M.-4:35 P. M. 927
(Total elapsed time 6.67 Hrs.)

Toledo E. B.	4 lb.	3 lb. 5 oz.	11 oz.	1.64 oz.	
Anthes	2 " 9 oz.	1 " 15 "	10 "	1.50 "	
Toledo O. S.	10 " 7 "	8 " 9 "	1 lb. 14 "	4.5 "	
Detroit	21 " 8 "	19 " 9 "	1 " 15 "	4.65 "	

Average fuel comsumption:

	Rate in Oz. per Hour
Toledo E. B.	1.637
Anthes	1.633
Toledo O. S.	4.634
Detroit	4.238

928 **Plaintiff's Exhibit 30**
March 8, 1938

WIND VELOCITY TEST

Object:

To determine relative ability of four torches to withstand wind velocities of varying intensities.

Apparatus:

Wind tunnel constructed by The Toledo Pressed Steel Company after design suggested by the DeVilbiss Co., who supplied the fan. (See photos herewith.) Various wind velocities are obtained
929 by the use of cardboard reduction plates having openings of 12½"x15½" diameter. These are applied to the intake end of the tunnel to restrict the flow of air and result in speeds which have been calibrated with a Tycos Van Type Anemometer as being 25.1 and 26.9 m.p.h., respectively, and the full opening wind velocity as 28.7 m.p.h. at a central point one foot from the discharge end of the tunnel.

One Anthes Truck Flare purchased from Montgomery, Ward & Co. at Lima, Ohio, and used as purchased.

930 One Toledo No. 5 Truck Flare.

One old style open flame Toledo Torch of spherical shape and three-quart capacity.

One old style triple wick burner, cast iron torch furnished by Mr. Kerwin, Supt. Ways & Structures, Detroit Street Railways Company. This torch was used just as furnished.

Procedure:

All torches were filled to normal level with straight kerosene of flash point 135°, sp. gr. .7995 at 60° Fah. The wicks in each the Toledo Truck Flare and the Anthes Truck Flare were set at ⅛"

Plaintiff's Exhibit 30

wick extension. This is according to directions for 931
Toledo Flares. No directions were supplied with the Anthes flare. The Wicks in the cast iron Detroit torch were set at 3/8" and in the old style Toledo Torch at 1½" extension. All torches were lighted and allowed to warm up.

The reduction plate with the smallest opening, 12½", was used first. Each torch was placed in position and the length of time it remained lighted for a period less than 15 minutes, was noted and recorded. If it remained lighted for 15 minutes, it was considered that it was stable in this wind velocity. This was repeated using the reduction 932
plate of 15½" opening and also without any reduction plates.

It was found that at any wind velocity, interception of the hand or hands between the flame and the wind source would extinguish the flame in the case of each of the open flame torches, but no arrangement of the hands would extinguish the flame on the Anthes or Toledo Truck Flares using the hood.

Conditions:

The test was conducted in the hallway com- 933
pressor room in the factory of The Toledo Pressed Steel Company, 397 Phillips Ave., Toledo, Ohio, beginning at 9:40 A. M. on Thursday, Jan. 27th, 1938. The test was conducted by Mr. Close and observed by Mr. Withrow.

Results:

	Time Remained Lighted		
Torch	25.1 mph.	26.9 mph.	28.7 mph.
Anthes	15 minutes	15 minutes	15 minutes
Toledo E B	15 "	15 "	15 "
Toledo O S	15 "	15 seconds	2 minutes, 30 seconds
Detroit	5 "	2 minutes	50 seconds

Plaintiff's Exhibit 30

934 *Conclusion*:

This experiment demonstrates that the stability of an open flame is an uncertain quantity, even though the wick is adjusted to meet severe conditions. It further demonstrates that with an increase in wind velocities, this uncertainty increases. It also demonstrates the stability of a flame controlled by design of the burner on these hooded torches.

935

936

Plaintiff's Exhibit 32

Plaintiff's Exhibit 32 937
March 9, 1938

IOWA
STATE HIGHWAY COMMISSION
AMES, IOWA

April 9, 1935.

The Toledo Pressed Steel Co.,
397 Phillips Avenue,
Toledo, Ohio.

ATTENTION MR. LYMAN W. CLOSE

Gentlemen:

In response to your recent request for information regarding our truck flare laws, their administration and the methods of tests for the flares used under the requirements of these laws, rules, regulations and the specifications developed for the flares, we have prepared the following statement: 938

Certain of the laws enacted by the Forty-Fifth General Assembly of Iowa Legislature, early in the spring of 1933, required that after May 4, 1933, motor trucks and motor truck combinations, during the period from one-half hour after sunset to one-half hour before sunrise, should be equipped at all times with portable flares. These flares were to be used in indicating the location of the vehicle when stopped on or adjacent to the travelled roadway during the hours of darkness. 939

The laws as stated in Chapter 83 of the Acts of the Forty-Fifth General Assembly failed to specify the enforcing agency, but it has been held that the Motor Vehicle Department was implied as this agency. Under this ruling it was further implied that the Motor Vehicle Department had authority to prepare rules and regulations for the enforcement of, and compliance with these laws.

Plaintiff's Exhibit 32

940 The rules and regulations issued by the Motor Vehicle Department have been published in a pamphlet of Motor Vehicle Laws prepared and circulated by that department. Two copies of this pamphlet have been enclosed. The flare laws are found on pages 21 and 22, and the rules and regulations arising from them on page 22.

In these rules and regulations the Iowa State Highway Commission became involved in the administration of the laws through a co-operative agreement with the Motor Vehicle Department to the extent whereby the Highway Commission
941 would test the flares and make recommendations regarding their disposition and use.

The first action of the Highway Commission was that of a survey of the types of flares which would be available for this use, and the second consideration was that of a specification and method of test for the selection of the flares which would be satisfactory. As a result, after a considerable amount of experimental work, specifications for flares were developed by the Highway Commission and approved by the Motor Vehicle Department. These studies were made upon all the readily available
942 types of flares and signal lamps which could be considered practical for the use to which they were to be put.

In the experimental work it first became necessary to select the characteristics of the flares to be observed and measured, and, second, to devise methods of tests for the accomplishment of these objectives. Four tests were devised, namely the wind test, the combined wind and rain test, the carbon deposition test, and the length of burning time test.

For the wind tests a wind tunnel was prepared

in which definite velocities of wind could be pro- 943
vided, and these velocities repeated as often as desired. After a somewhat lengthy consideration of actual operating conditions as they would exist for these flares when used in Iowa, two velocities were selected for these tests, one of 40 miles per hour, and the other of 26 miles per hour.

In the combined rain and wind test, the wind velocity was 26 miles per hour, and the rain applied at the rate of 2.48 inches per hour. In the carbon deposition test, the amount of carbon and its effect on the behavior of the flare was noted after two hours of operation in a quiet atmosphere. The 944
length of burning time was determined by actual tests of the flares or lamps under actual operating conditions.

The specifications for the flares which were adjudged to be satisfactory required, for the wind tests, that the flare remain lighted at least 30 seconds in the wind at 40 miles per hour, and that it should burn continuously in the wind at 26 miles per hour; that the flare burn for at least five minutes in the combined rain and wind test; for the carbon deposition test, that the carbon deposit be light and the flare burn, or remain in such con- 945
dition that it would pass the two preceding tests; for the burning time tests, that the flare or lamp remain lighted for at least eight hours.

In the experimental work preceding the development of these tests and the preparation of the specifications, it was found that a considerable number of flares could be made available for use as satisfactory signals under the requirements of the truck flare law. The principal group of these flares were of the oil burning, wick equipped class. These were of two general types, the open or un-

946 protected flame type and the hooded, or protected, flame type. None of the open flame type gave satisfactory performances in the tests described above, particularly the wind and the combined wind and rain tests.

The hooded or protected flame type proved to be a great improvement over the open flame type. There were offered, however, samples of the hooded type which failed to meet the requirements of the above specifications, principally for the reason that the combustion chamber within the hood protecting the flame was either insufficiently
947 ventilated, or was too small to permit satisfactory combustion of the oil and gases down from the wick.

As a result none of the open flame type were considered satisfactory for use in this work, and the results of these tests were checked by observations of the performance of the open flame type, which have been used in some form or another as flares indicating obstructions, work under construction, or barricades on construction projects.

All of the hooded or protected flame type were found to be a great improvement over the open
948 flame type as produced by the same manufacturer. In several instances manufacturers originally producing open flame types of flares improved them by enclosing, hooding, or in some manner protecting the flame. In some cases, however, manufacturers not previously producing flares presented samples of hooded types of flares which were unsatisfactory. In the majority of cases the flares were made satisfactory by re-designing or improving the construction of the hood, cap, or other protection for the flame.

Plaintiff's Exhibit 32

We believe this will give you, briefly, the history 949
of the development of flares, flare tests, and flare specifications, as they have been accomplished in Iowa.

We regret that we were unable to comply with your request soner, but illness and other pressing duties have delayed action on our part.

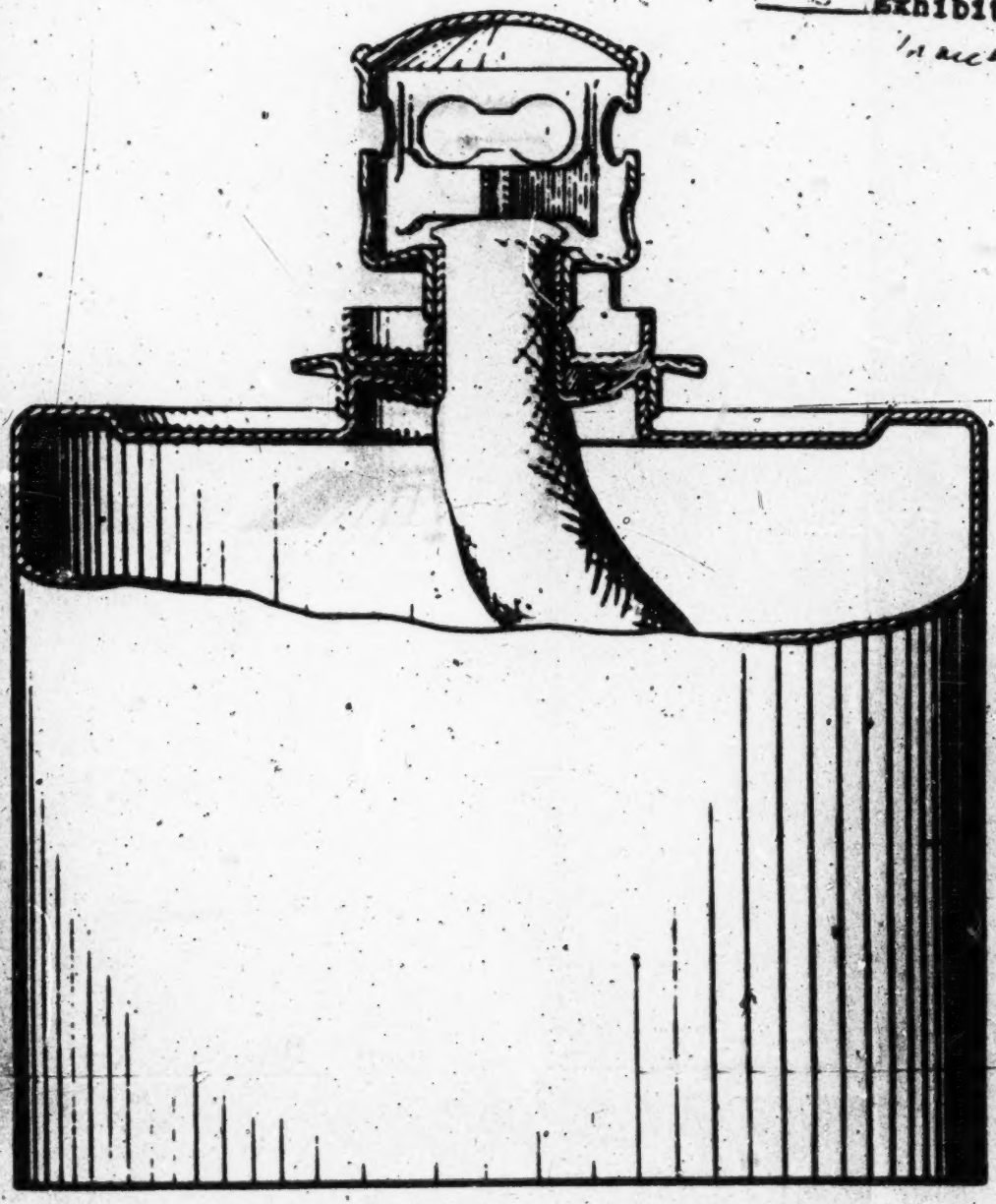
Yours very truly,
(Signed) MARK MORRIS,
Research Assistant

MM:BY
Enclosures

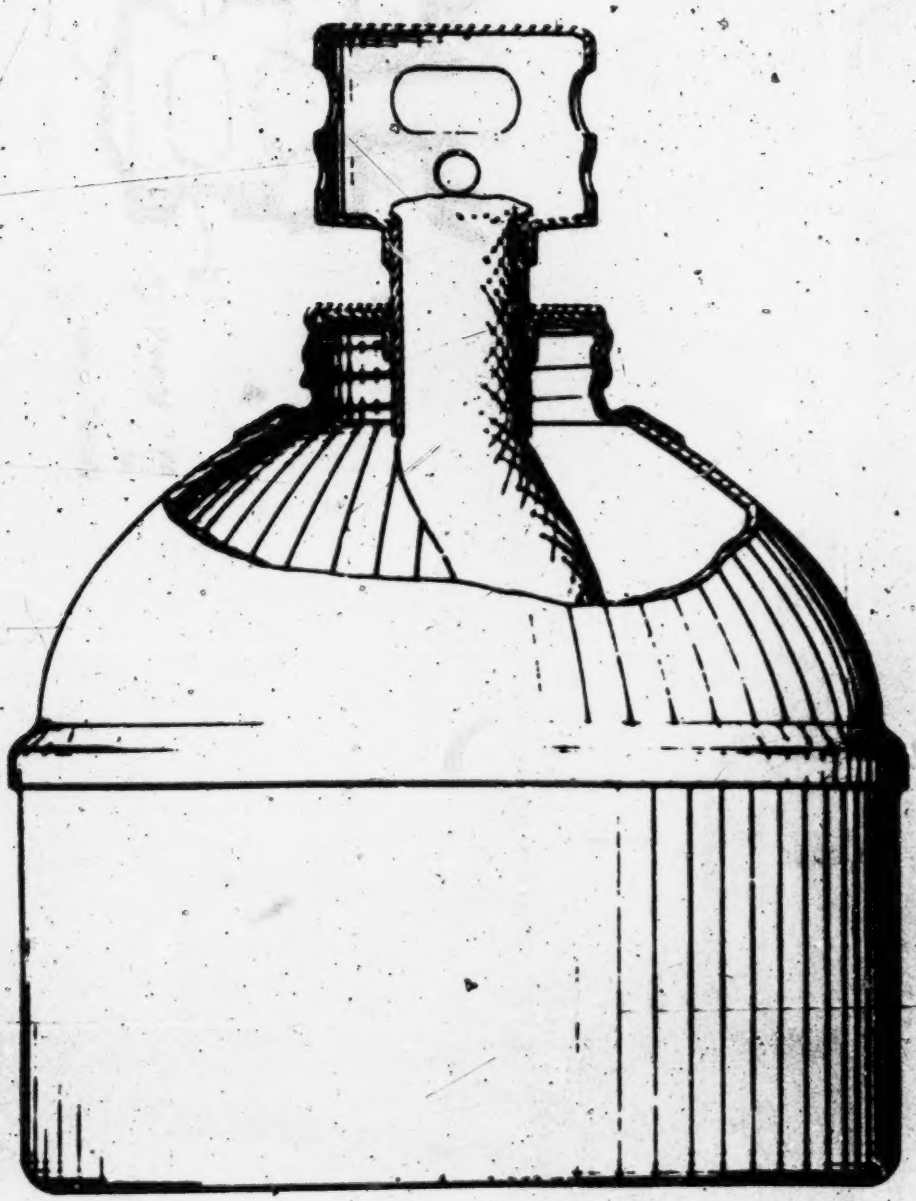
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U.S. District
Court E.D.N.Y.
In Equity 8'41/
4 Exhibit 35
Inman-4-



U.S. District
Court E.D.N.Y.
In Equity
Exhibit 34



... District
Court E.D.N.Y.
In Equity 141
Exhibit 12

TOLEDO PRESSED STEEL CO
vs
MONTGOMERY WARD CO.
NO E 8417
DEPT'S EX. 3

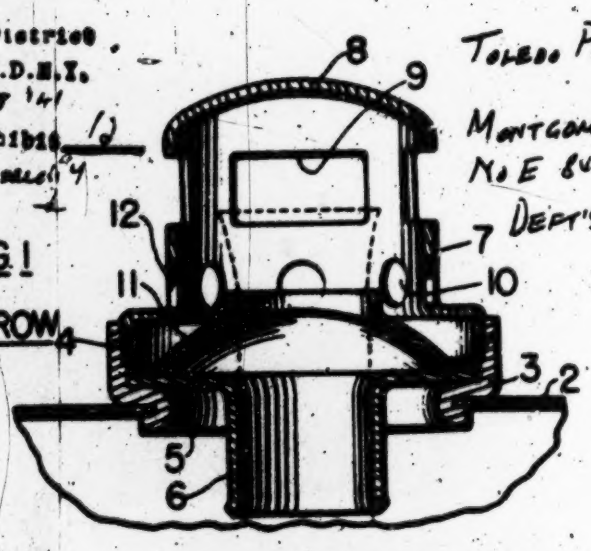


FIG. 1
WITHROW

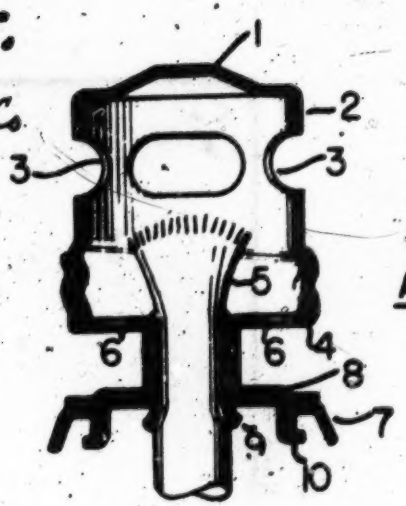


FIG. 2
ANTHES

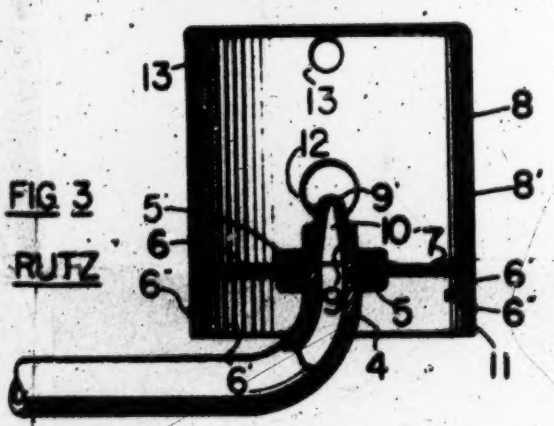


FIG. 3
RUTZ

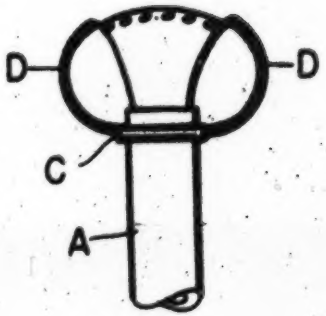
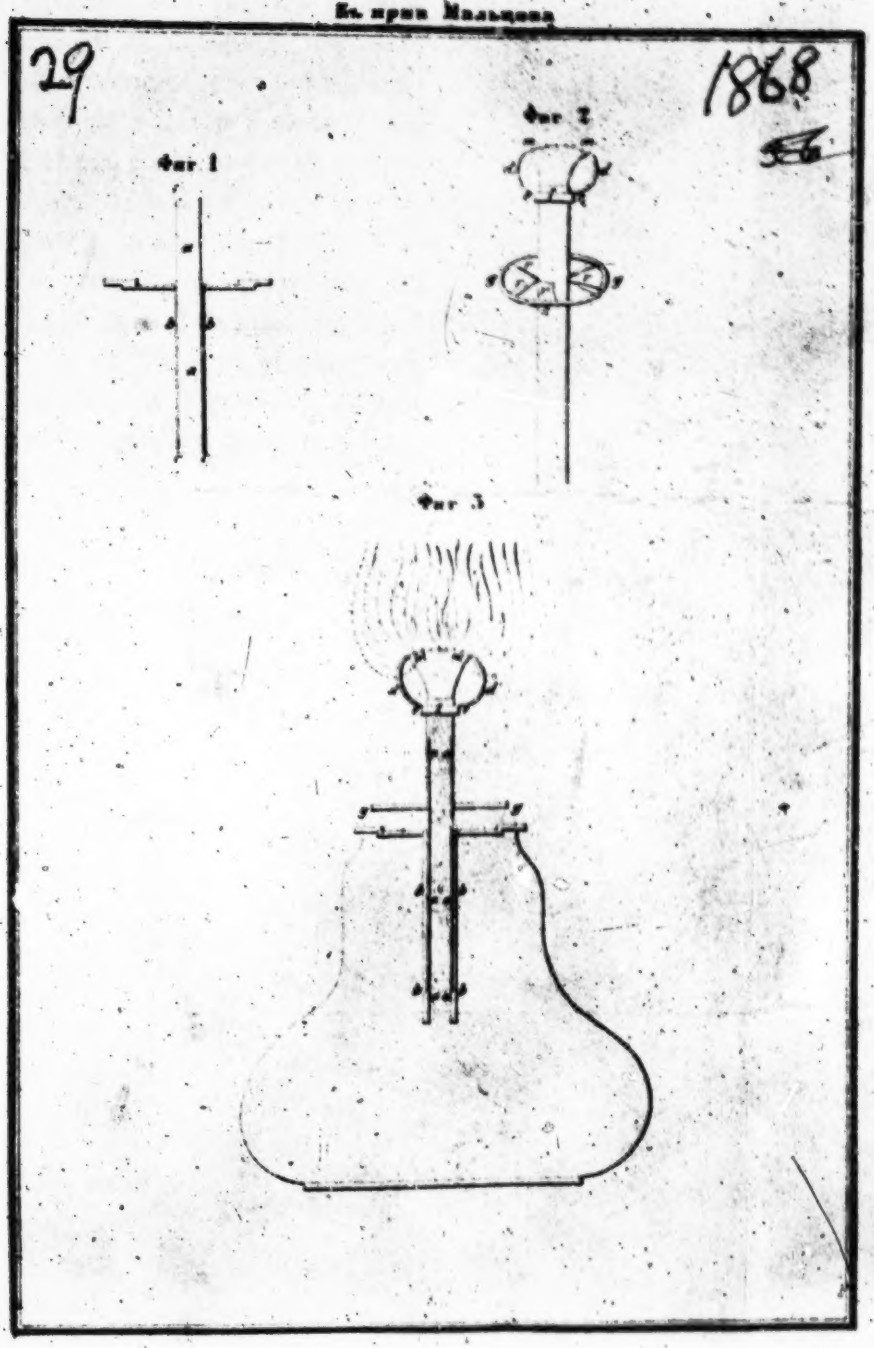


FIG. 4
MALCOV

328

1163



Defendant's Exhibit C 979

Translation from Russian

Malcov Patent

1163. 29-1868

Drawing to Patent Granted to Malcov.

29) To Major General Malcov, Patent on a Lamp Burner of Special Construction, Issued on July 9, 1868, for the duration of five years, on Application of Citizen Veselov of August 8, 1867.

Explanation of the submitted specification: in the drawing Figure 1 is the burner, in which the tube *a* is not fixed to the disc directly but by means of another tube *b* soldered at *c* to the lower end of 980
the tube *a*. In this manner bewteen the tubes *a* and *b* there remains a space into which may enter a third tube called regulator and intended for the adjusting of the size of the flame. Into the tube *a*, as shown in Figure 3, is introduced the wick made of capillary material and capable of conducting rapidly both the liquid as well as its vapors from the reservoir of the lamp. In order to protect the top portion of the wick from deterioration, the upper portion of the burner directly above the wick is packed with asbestos, crushed charcoal or some other incombustible material readily conducting 981
liquid; in this connection care is to be taken that no more than ¼" of free space is left to the upper exterior end of the burner. Figure 2 shows the regulator, which is longer than the tube shown in Figure 1; in the upper portion of the regulator soldered (cemented) with red copper are provided perforations designated in the drawing by dots. The upper portion of the regulator on both sides is traversed by the two arcs *d, d*, connected with the ring *c*, but not constituting an essential part of the burner. These arcs are arranged for the purpose

982 of heating the regulator and transforming the liquid into gas. The ring *g* with radii *r* soldered to the tube of the regulator serves for the raising and lowering of the regulator, depending on the requirements. In Figure 3 is shown the lamp with the regulator, the tube of which regulator is introduced between the tubes *aa* and *bb* of the burner for the purpose of preventing the gas, which is fairly heavy, from passing downward, as otherwise not all of the gas would pass through the openings provided in the upper portion and would not combust completely, but would volatile
983 without usefulness. The lamp of the described construction is extinguished by raising of the burner.

The present invention has been examined in the Councils of Manufacture and the Ministry of Finance.

984



Fig. 4.

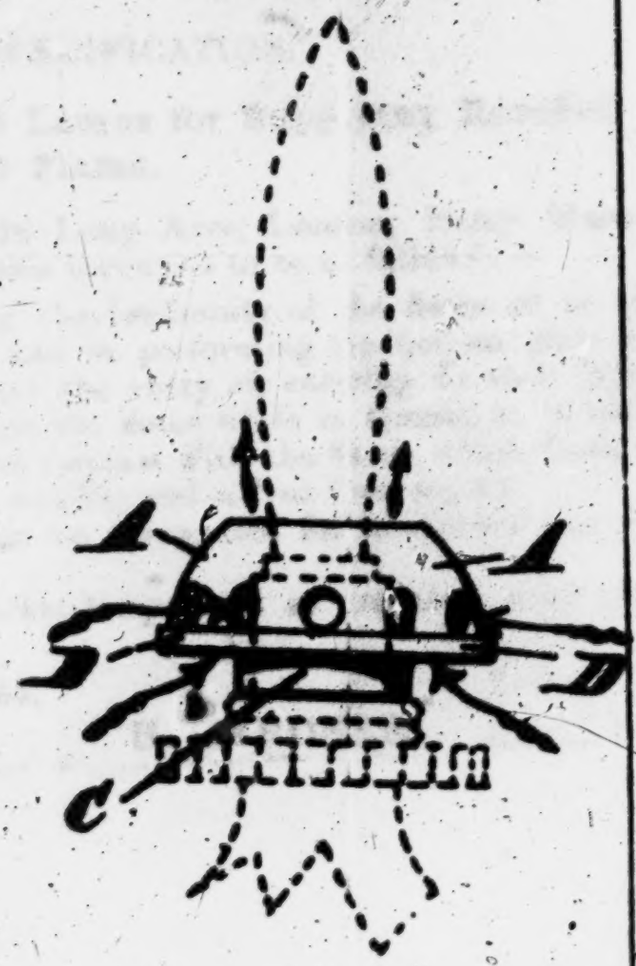


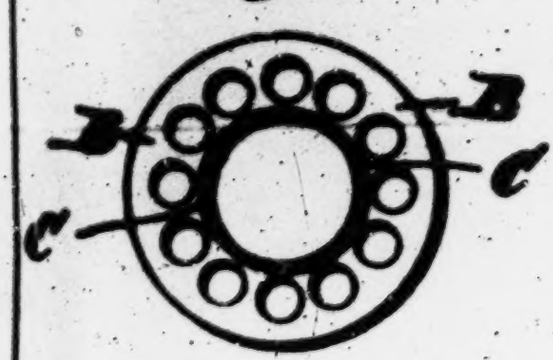
Fig. 1.



Fig. 2.



Fig. 3.



"This Drawing is a full size representation of the Original."

London: Printed by Harrison and Sons
for Her Majesty's Stationery Office. 1916.

N° 16,524 A.D. 1895

Date of Application, 3rd Sept., 1895

Complete Specification Left, 3rd June, 1896—Accepted, 4th July, 1896

PROVISIONAL SPECIFICATION.

An Improvement in Domes of Oil Lamps for Supplying Rarefied Air to the Flame.

I, HENRY SALSBURY, of 125 and 126 Long Acre, London, Lamp Manufacturer, do hereby declare the nature of this invention to be as follows:—

This invention has for object, improving the luminosity of the flame of an oil lamp by making the dome of such shape and in perforating the bottom plate as well as the upper surface near the rim, that the entry air entering by such holes takes up heat from the wick tube and from the dome while in transit, as to issue from an annular or other recess into direct contact with the flame, which flame is not only enriched thereby but burns more steadily and is free from smoke.

The neck of the dome may be split or be corrugated for increasing the air passages.

The invention is chiefly intended for socket lamps such as are used with road vehicles.

Dated this 3rd day of September 1895.

H. GARDNER,
Patent Agent, 166 Fleet Street, London,
Agent for the said Henry Salsbury.

COMPLETE SPECIFICATION.

An Improvement in Domes of Oil Lamps for Supplying Rarefied Air to the Flame.

I, HENRY SALSBURY, of 125 and 126 Long Acre, London, Lamp Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention has for object, improving the luminosity of the flame of an oil lamp by making the dome of such shape and in perforating the bottom plate as well as the upper surface near the rim that the entry air entering by such holes takes up heat from the wick tube and from the dome while in transit as to issue from an annular or other recess into direct contact with the flame, which flame is not only enriched thereby but burns more steadily and is free from smoke. The neck of the dome may be split or be corrugated for increasing the air passages.

The invention is chiefly intended for socket lamps such as are used with road vehicles.

My invention is clearly represented in the annexed drawings.

Figure 1 side elevation of dome.

Figure 2 section.

Figure 3 plan of base.

Figure 4 side elevation of position occupied by dome on my previously Patented Anti Candle Lamp No. 22196 of the year 1892 to which it is specially but not exclusively applicable.

[illegible]

A, cap. B, base. C, neck, which is preferably in two pieces and lunk in opposite directions, the two being clamped as one by the rim D of the cap or dome A. The neck may be part of the wick tube or an sleeve outside a wick tube both disc and dome being perforated or otherwise formed with air passages to feed the flame and increase its luminosity by the concentration and inward deflection, the heat generated by contact in passing through the dome rendering such air rarefied and more suitable for combustion and producing increase of light, said air issuing from an annular or other aperture into direct contact with the flame.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed I declare that what I claim is:—

1. The improvement in domes for oil lamps, as described for the purpose set forth.

2. Constructing domes for oil lamps of two perforated discs with necks inverted and clamped within the rim near which are other perforations as shown on the annexed drawings for the purpose described.

The 3rd day of June 1895.

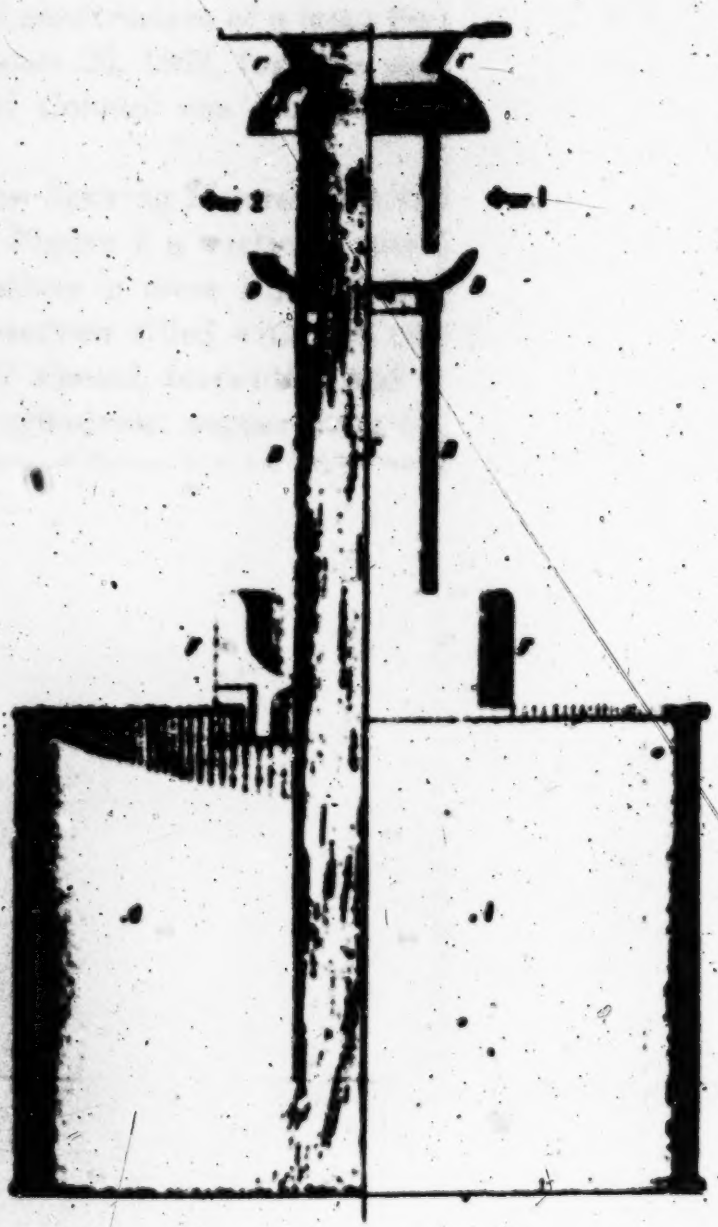
H. GARDNER,
Patent Agent, 166 Fleet Street, London,
Agent for the said Henry Salsbury.

London: Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—1896.

335

VON DER WEIDE, RUSSIAN
No 1261 of 1869
DEFT'S EX. 8

68. 1564



1261

Defendant's Exhibit C

Defendant's Exhibit C 1009
Translation from Russian
Von der Weide Patent

1261. 68-1869. Drawing
To patent granted to von der Weide.
Page 161.

68) Patent granted to Colonel von der Weide on special construction of a lamp for railroads; issued November 20, 1869, for five years, upon application of Colonel von der Weide of February 14, 1869.

In the drawing Figure 1 is a side elevation of the 1010
lamp, Figure 2 a vertical cross section of same. The letters in these Figures designate: A—a copper reservoir filled with fuel consisting of a mixture of alcohol, turpentine and carbon disulphide; B—a cylindrical copper tube from 7" to 8¾" in height and from ¾" to 1" in diameter; C—copper horn of frustroconical form with smooth top surface, under which is disposed an exterior oval globe in the shape of a parasol, which facilitates a more complete combustion of gaseous products; in the bottom portion of this horn are provided perforations for free passage of the fuel vapors; D— 1011
annular copper cup soldered around the cylindrical tube B at a distance of 1½" from the top surface and serving for the receiving of liquid fuel by which the horn C is heated; E—the wick of cotton threads fitted into the cylindrical copper tube B; F—a threaded copper ring fastened to the cylindrical tube B and connected hermetically with the reservoir A with the aid of a rubber plate.

The invention has been examined in the Department of Railways and in the Councils of Manufacture and the Ministry of Finance, but the patent

1012 is issued to the effect that it is restricted to the exterior oval globe (hood) or parasol facilitating the more complete combustion of the gaseous products, but does not extend to the other constituent parts of the above described lamp.

1013

1014

340

W. HATHAWAY.

Lamp-Burners.

No. 147,496. Patented Feb. 17, 1874.

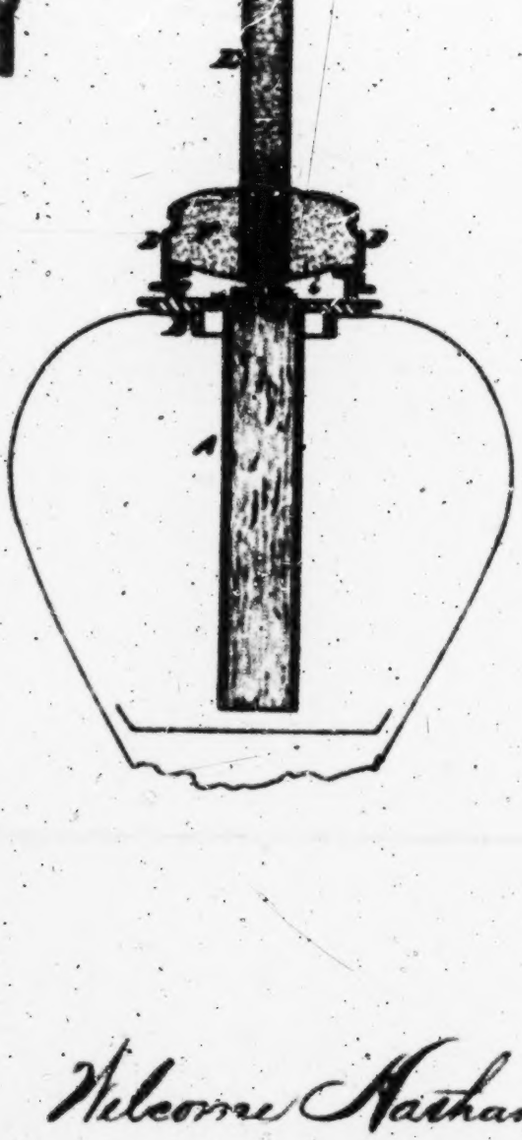
Fig. 1.



Fig. 2



Fig. 3.



Witnesses
John L. Boone
C. Milton Richardson

Welcome Hathaway
by Dewey & Co
Attys

UNITED STATES PATENT OFFICE.

WELCOME HATHAWAY, OF OPHIR, CALIFORNIA.

IMPROVEMENT IN LAMP-BURNERS.

Specification forming part of Letters Patent No. **147,496**, dated February 17, 1874; application filed December 18, 1873.

To all whom it may concern:

Be it known that I, WELCOME HATHAWAY, of Ophir, county of Placer, State of California, have invented an Improved Burner for Lamps; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to an improved burner which is especially adapted for burning gasoline and other light products of a similar nature, such as are brought to the burner and vaporized previous to being ignited.

My invention consists in a cap or coupling for holding the upper part of the wick-tube, and so constructed that it contains a removable non-conducting substance and a small gas-chamber. It also consists in a peculiarly-constructed burner, as more fully hereinafter described. A combination of inflammable and non-inflammable substances is employed to conduct the gasoline or other fluid to the vaporizer and burner.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1 is a side elevation of my device. Fig. 2 is a view of the burner or cap. Fig. 3 is a sectional elevation of the device.

A is the tube, which is made of such length that it will reach from near the bottom of the lamp or receptacle for the liquid to a point just above the top of it. A screw-cap, B, fits into the top of the lamp in the ordinary manner, and just above this screw is another screw-cap, C, which forms the lower part of the coupling. The upper part of the coupling D fits down upon the screw C, and has a hole through its top somewhat larger than the tube E. The interior of the part D is closely filled by a cork, F, through which the tube E passes, fitting closely, and it is thus prevented from touching the sides of the coupling D. This makes the device non-conducting, and no matter how hot the tube E may become, the heat will not pass down so as to affect the tube A. A broad flange is formed upon the top of the screw C, and when the parts are screwed together, a tight joint will be formed by the cork which presses upon the flange, and a small gas-chamber, *i*, left beneath the cork.

The lower tube A may be filled with cotton-wicking; but the upper tube E should be filled with asbestus, which will not be acted upon by heat, the asbestus just resting upon the wick when the parts are united.

The burner or vaporizer G is placed at the top of the tube E, and consists of a cap which fits upon the top of the tube. This cap is closed at the top, and has a series of horizontal holes around it near the top. A series of lips, H, are formed to bend down from the top all around the cap and between the jet-openings, so that each jet passes out between two of these lips, and is thus protected from air-currents, and while the lamp is being carried from place to place, so that it is not easily extinguished. Above the jet-openings are a series of lugs, I, which may be bent upward or more horizontally if it is necessary to have a greater heat for more perfect vaporization and combustion; and by this construction I am enabled to make my burner adjustable.

Different caps of various sizes and shapes may be employed for larger or smaller lamps; but by means of the lips H and adjustable projections I, I am always enabled to regulate and protect the flame.

The coupling C D, with its non-conducting packing, renders it impossible to overheat the liquid in the lamp, while, by extending the tube A to the bottom of the lamp inside, it will not be possible to ignite the liquid from the burner.

By making the tube E somewhat smaller than the tube A, the liquid will be carried to the burner more readily.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The burner G, consisting of the horizontally-perforated cap provided with the lips H and the adjustable lugs I, substantially as and for the purpose herein described.

2. The bisected wick-tube A E, in combination with the flanged screw cap C, cap D, and removable non-conducting material F, constructed and arranged to form the gas-chamber *i*, as set forth.

In witness whereof I hereunto set my hand and seal.

WELCOME HATHAWAY. [L. S.]

Witnesses:

JOHN L. BOONE,

C. MILTON RICHARDSON.

PAGES - 342

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(No Model.)

P. WALL.
Mill-Lamp.

No. 228,497. Patented June 8, 1880.

Fig. 1

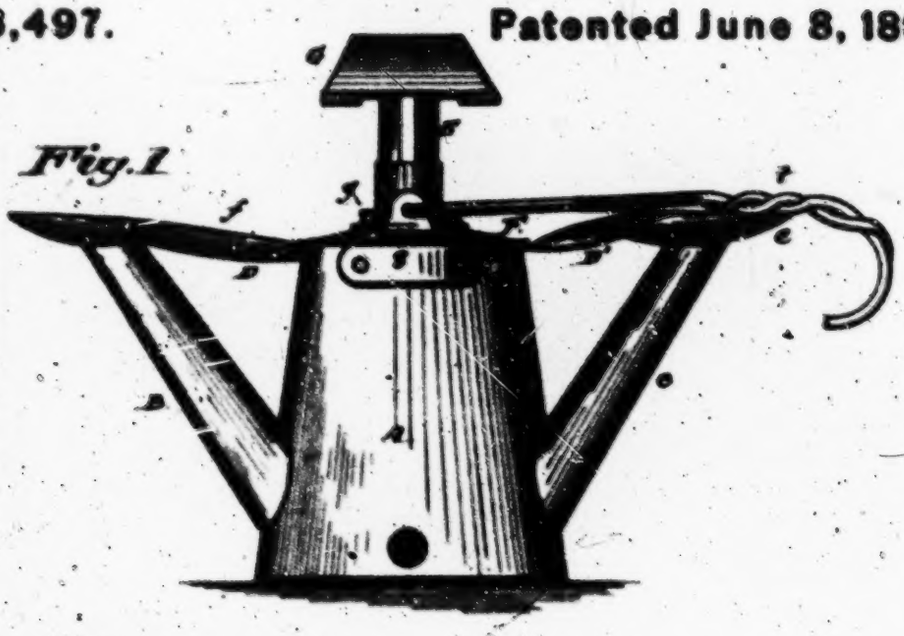


Fig. 2

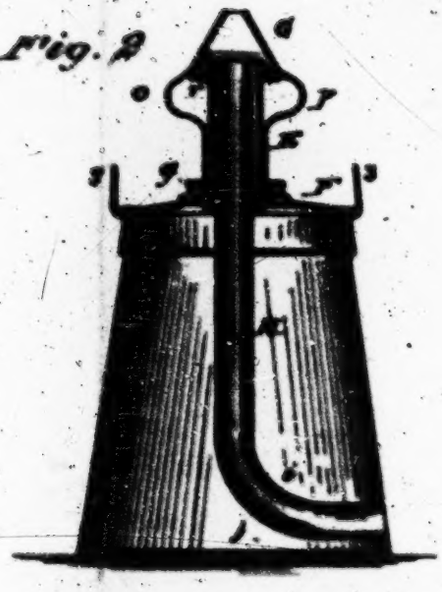


Fig. 4

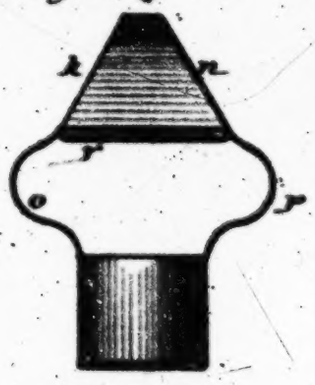


Fig. 5

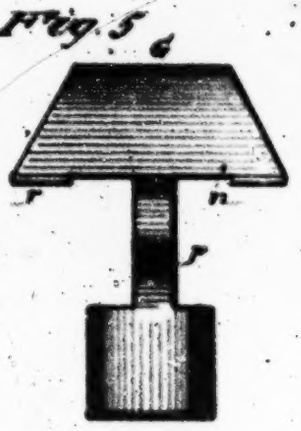
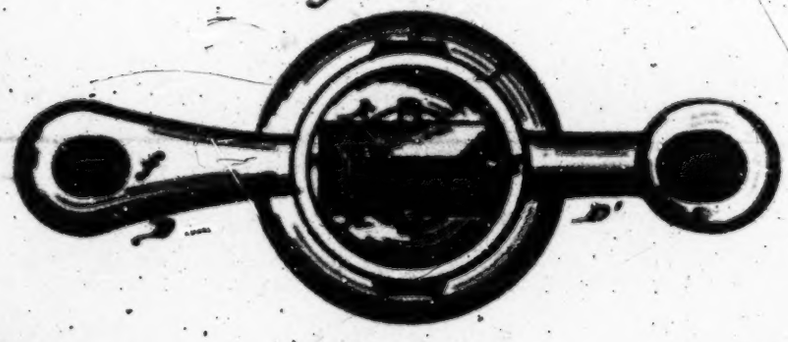


Fig 3



WITNESSES

Rud. G. Dieterich

Albert D. Kramer

INVENTOR

Patrick Wall

UNITED STATES PATENT OFFICE.

PATRICK WALL, OF ALLEGHENY, PENNSYLVANIA.

MILL-LAMP.

SPECIFICATION forming part of Letters Patent No. 228,497, dated June 8, 1880.

Application filed April 17, 1880. (No model.)

To all whom it may concern:

Be it known that I, PATRICK WALL, of Allegheny, county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Mill-Lamps; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in that class of lamps known as "mill-lamps" or "torch-lamps;" and it consists in providing it with three wick-tubes, a detachable burner, and a means for conveying the waste or unconsumed oil back into the body of the lamp, the central wick-tube having a central air-inlet extending from near the bottom of the lamp up through the body of it to the top edge of the wick-tube, the whole being constructed, arranged, combined, and operating as hereinafter described.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a side elevation of my improvement in mill-lamps or torch-lamps. Fig. 2 is a vertical section of the same at right angles to the detachable burner. Fig. 3 is a top view of Fig. 1. Figs. 4 and 5 are end and side elevations, respectively, of the detachable burner.

In the accompanying drawings, A represents the body of the lamp; B C, the side wick-tubes, which are braced and stayed at their upper ends through the medium of the pieces D D', one of which serves the double purpose of brace and conductor for conveying the unconsumed oil back into the body of the lamp. The outer ends of the braces D D' surround the wick-tubes B C near their upper edge, and are dished, so as to form receptacles for the waste or unconsumed oil which flows over the upper edge of the wick-tubes B and C, which flow of oil will be in proportion to its specific gravity, the overflow always being greater when light.

The brace D', where it surrounds the wick-tube C, forms a circular dish, *e*, (shown in Figs. 1 and 3,) which does not communicate with the body A of the lamp through the medium of a channel made in the brace, like that shown at *f* in Figs. 1 and 3; but I wish it understood that the wick-tubes B and C may be furnished with either form of the braces and dished receptacles for the waste oil and come within my invention.

The center wick-tube, E, is attached to the lid F of the lamp by means of an ordinary screw-cap, as shown at *g* in Fig. 2. This wick-tube is provided with a central air-flue, H, which extends from the top edge of the wick-tube E down through it, the body A of the lamp being curved at *i* and its lower end secured to the side of the body and near its bottom *j*.

The detachable burner G consists of four inclined walls, *k*, *l*, *m*, and *n*, which converge toward a common center, the lower edge of the walls *k* and *n* being connected to two arms, *o p*, which terminate in a sleeve, which is fitted to the wick-tube E, for holding the burner G in position with relation to the upper end of said wick-tube.

The bottom or under side, *r*, of the burner G is provided with an annular opening, through which the wick-tube E passes. This opening is sufficiently large to leave a space around the wick-tube for the admission of air to the burning wick.

The body of the lamp is provided with lugs *s* for the bail *t*, which is of ordinary construction.

Mill-lamps are usually constructed of thin sheet-iron; but I prefer using sheet-iron of No. 20 to 22 gage, and braze the seams. Such construction of lamp will be much stronger, more durable, and less liable to leak oil.

The operation of my improvement in mill-lamps is as follows: The wick-tubes being supplied with wick and the lamp filled with oil, the wicks are then lighted, and the burner G is then placed on the wick-tube E, as shown in Figs. 1 and 2, which will cause the flame of the wick-tube E to burn in a broad thin sheet, the brightness of which is greatly increased by the current of air passing up through the flue H, combined with the current of air which enters the burner G through the annular opening around the exterior of the wick-tube E.

The advantage of the center wick-tube consists in being enabled to use it when combined

with the burner G for a stationary light, which is often required in a rolling-mill when making repairs.

When the lamp is used for a moving light the wicks in the tubes B and C are lighted.

The wick often carries up more oil than the flame consumes. The overflow or unconsumed oil flows down into the dish around the wick-tube, where it becomes heated and ignited, thereby causing an increase of the flame of the lamp, and any oil that is not consumed by the flame is returned to the body of the lamp through the medium of the conducting-channel *f* in the brace D, thereby preventing the overflow oil from running down the exterior sides of the lamp, which is a very objectionable thing in a mill-lamp.

Having thus described my improvement, what I claim as of my invention is—

1. In a mill-lamp, the combination of a lid provided with a detachable wick-tube having a central air-flue with a detachable burner, G, having inclined sides *k l m s* and arms *o p*, terminating in a sleeve, substantially as and for the purpose herein shown and described.

2. The herein-described mill-lamp, consisting of the body A, provided with the side wick-tubes, B C, braces D D', forming dish-shaped receptacles around the upper ends of the wick-tubes, lid F, provided with the detachable wick-tube E, having a central air-flue, H, and a detachable burner, G, provided with inclined sides *k l m s* and arms *o p*, terminating in a sleeve, substantially as and for the purpose specified.

PATRICK WALL.

Witnesses:
A. C. JOHNSTON,
J. J. JOHNSTON.

348

(No Model.)

W. HESTON.

VAPOR BURNER.

No. 270,587

Patented Jan. 16, 1883.

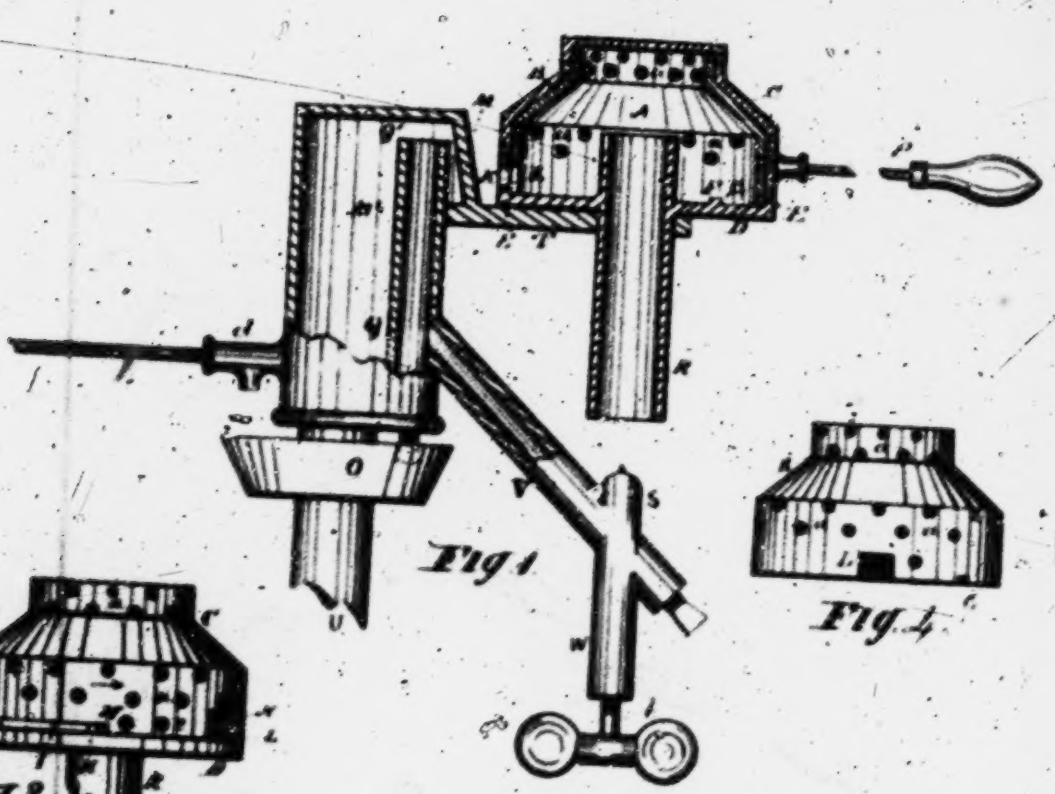


Fig 1

Fig 4



Fig 3

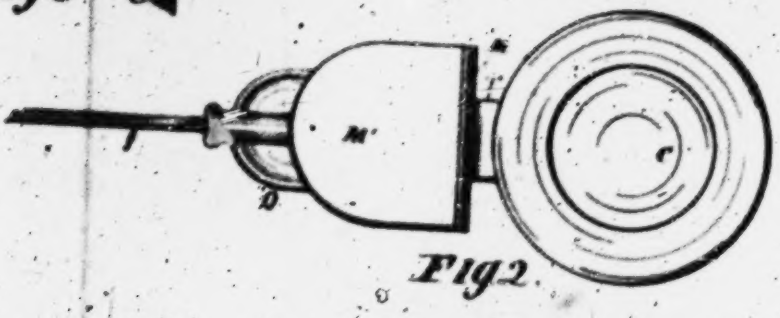


Fig 2



Fig 5

Witnesses.
J. H. Burridge
F. L. Ivers

Inventor
Wm Heston
by H. Burridge
Atty

UNITED STATES PATENT OFFICE.

WILLIAM HESTON, OF MOUNT UNION, ASSIGNOR OF ONE-HALF TO JAMES E. INGERSOLL, OF BEDFORD, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 270,587, dated January 16, 1883.

Application filed October 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HESTON, of Mount Union, in the county of Stark and State of Ohio, have invented a certain new and Improved Vapor-Burner; and I do hereby declare that the following is a full, clear, and complete description thereof.

This improvement relates to a vapor-burner, the nature of which consists of double perforated caps, one of which is stationary and the other movable for the purpose of regulating the flame-jets, and to cause a small jet to continue burning to avoid the trouble and delay in relighting.

The improvement also relates to the means employed for generating the vapor from the oil for combustion in the dome.

For a more full and complete description of the said improvements reference will be had to the following specification, and to the annexed drawings, making a part of the same, in which—

Figure 1 is a view of a vertical section in part of the vapor-burner; Fig. 2, a top view. Figs. 3, 4, and 5 are views of the perforated caps detached.

Like letters of reference refer to like parts in the several views.

The combustion-chamber A, Fig. 1, is inclosed by two perforated caps, B C, of which B is the inside stationary cap and C the outside movable one. The interior cap is adjusted to the base or floor D of the combustion-chamber, so as to fit on the inside of the flange E, and is prevented from turning by means of the lug or pin F, which projects from the base into a slot, G, in the lower edge of the cap, as seen in Figs. 1 and 4. This pin and slot prevent the cap from turning; but it may be readily removed and replaced, as occasion may require. The exterior cap, C, fits down over the interior one, and closes up the opening in the upper part or top of the interior one. The lower edge of the exterior cap, C, rests upon the flange E of the base D, while the interior cap is on the inside of the flange E, which flange prevents the inside cap from moving laterally, and thereby the exterior cap is also prevented from moving laterally, but is free to turn horizontally, so as to open or close the perforations in the caps, respectively. The exterior cap is permitted to turn only a certain distance sufficient to regulate the gas-jet from the perforations *a*. This is attained by means of lug H, projecting from the upper edge of the flange E into the elongated slot or opening I in the lower edge of the exterior cap. The shoulders at each end of the opening determine the distance of the horizontal rotation of the cap, as lug H forms a stop for the shoulders. When full jet-flames are required the exterior cap is turned in the direction of the arrow, Fig. 3, until the shoulder J is brought in contact with lug H, or nearly so, which will close the openings K and L and open the perforations *a* in the respective caps. The volume of flame-jets may be more or less reduced by turning the exterior cap in a reverse direction of the arrow, which will close up the perforations *a*, as required, for less heat. This closing of the perforations is due to the blank spaces of the exterior cap covering over the perforations of the interior cap. This opening and covering of the perforations in the interior cap causes more or less volume of flame to issue from the combustion-chamber A. On turning the exterior cap so that the shoulder N will be in close proximity to the lug H, the perforations of the interior cap will be closed over by the blank spaces between the perforations of the exterior cap. In this position the openings K and L will coincide with each other and will have a flame-jet issue from the chamber A through them, and impinging on the face M of the generating-chamber M′; but as the volume of flame from these joint openings is much less than from the perforations of the caps there will be less heat imparted to the chamber M′. Hence less gas is generated from the oil therein, but sufficient will be evolved to produce a low constant flame, enough at any time to cause full jets to issue from the perforations on turning the exterior in the direction of the arrow, so as to increase the heat upon the generating-chamber from the openings. In this way, after the first lighting of the burner by means of the oil-cup O, it need not be resorted to, as the burner may be fully inflamed from the result-

ant effect of the jet from the joint openings K L of the caps. When the perforations are in full-open relation with each other, so that the maximum volume of jets is attained, the perforation *c*, Figs. 3 and 5, will then coincide with the opening L in the interior cap, Figs. 1 and 4, to cause a jet to pass from the combustion-chamber through this space, which otherwise would be blank, and to be impinged upon the generating-chamber. It will be noted that the opening L will at all times be in the same position, directly opposite the upper part of the generating chamber, as seen in Fig. 1.

The turning of the exterior cap is so regulated or determined by the lug H, in connection with the slot I and the shoulders J N, that the cap can only be turned a given distance, and when moved to the position seen in Fig. 3 the perforations *a* are closed and the openings K L made to coincide, so that a light low flame issues therefrom, and on turning the cap C in the direction of the arrow the openings K L are closed and the perforations opened accordingly.

To the cap C is connected a handle, P, for turning it.

Connected with the base or floor of the chamber A is a conducting-tube, R, which is in open relation with the needle-valve mechanism S at its lower end, the upper end opening into the combustion-chamber, as seen in Fig. 1. The tube R is supported in a bracket, T, attached to the generating-chamber M', Figs. 1 and 2, by which the combustion-chamber is held in position. To the lower end of the generating-chamber is attached a supply-pipe, U, leading to the oil-supply tank. (Not shown, as it may be same as ordinarily used for this purpose.) In the interior of the generating-chamber is a vapor-pipe, Q, closed at the lower end and open at top into the generating-chamber, as seen at Q'. This vapor-pipe forms a part of the said chamber M'.

Extending from the vapor-pipe Q, and in open relation therewith, is a branch pipe, V, which connects with the needle-valve pipe W, in which is fitted the needle-valve, the stem *b* thereof being provided with a handle for operating in the usual way.

Directly under the generating-chamber and attached to the pipe U is an oil-cup, O, Figs. 1 and 2, into which oil is conveyed from the lower part of the generating-chamber M' by means of the valve-cock 4, which admits of more or less oil passing from the chamber M' into the cup, as may be required. The supply may be stopped entirely by closing the valve-cock, the stem of which is seen at *f*, Figs. 1 and 2. On the oil being conveyed to the generating-chamber M' and the cup supplied, as before stated, the ignition of the oil in the cup will convey heat to the generating-chamber, causing generation of vapor from the oil, which will pass through the pipes Q V to the needle-valve pipe or chamber, thence through the conductor R into the combustion-chamber, from which chamber it issues through the perforations and openings before set forth. A portion of the flame from the chamber A passes through perforations or openings adjoining the upper part of the generating-chamber, thereby supplying the required heat for the constant generation of the gas or vapor so long as the supply of oil is continued. The upper end of the pipe Q is in close proximity, at Q', to the upper end of the generating-chamber M', by which regurgitation of the oil through the pipes on igniting the burner is arrested, as the rapid generation of gaseous vapor above the oil in the chamber will have sufficient pressure above the oil to resist the ebullition of the oil engendered by the heat from the cup O when ignited, and thereby preventing its passage through the pipes to the combustion-chamber.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In vapor-burners, the two perforated caps B C, arranged one within the other, the interior one being stationary and the exterior one movable therein, and provided with openings K L, slot I, and lug H, in combination with the pipe R and needle-valve mechanism, substantially as described, and for the purpose set forth.

2. In vapor-burners, an improvement consisting of double perforated caps B C, provided with openings K L, the interior cap being stationary and adjusted to the floor of the combustion-chamber within the flange E, and the exterior cap, C, inclosing the said cap B and turning upon the same, in combination with the pipe R, generating-chamber, and needle-valve mechanism, substantially in the manner as described, and for the purpose specified.

3. In vapor-burners, the combustion-chamber having a stationary and movable cap, slot I, and pin H, with a pipe extending from the needle-valve mechanism into the interior of said chamber, in combination with the bracket T, generating-chamber, openings K L, and pipes Q V, arranged substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM HESTON.

Witnesses:
W. H. BURRIDGE,
J. H. BURRIDGE.

352

T. R. ALMOND.

VAPOR BURNERS FOR HEATING PURPOSES.

No. 193,796. Patented Aug. 7, 1877.

Fig. 1

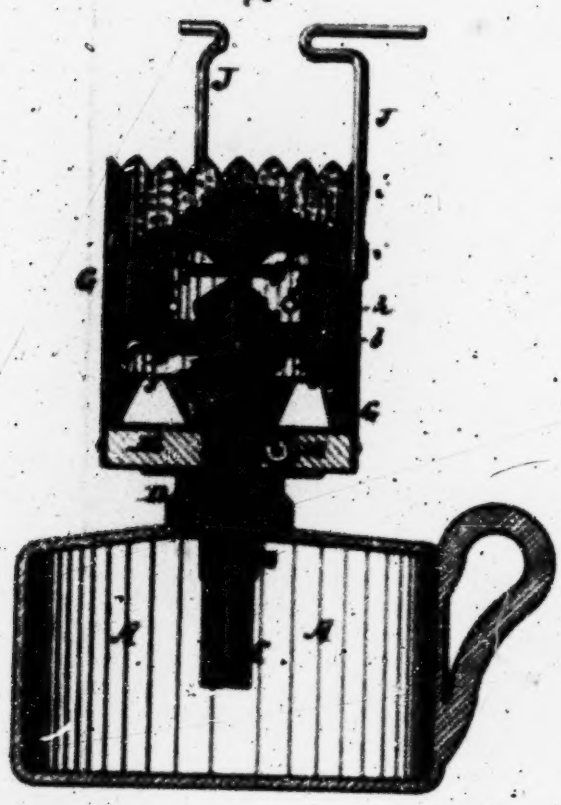
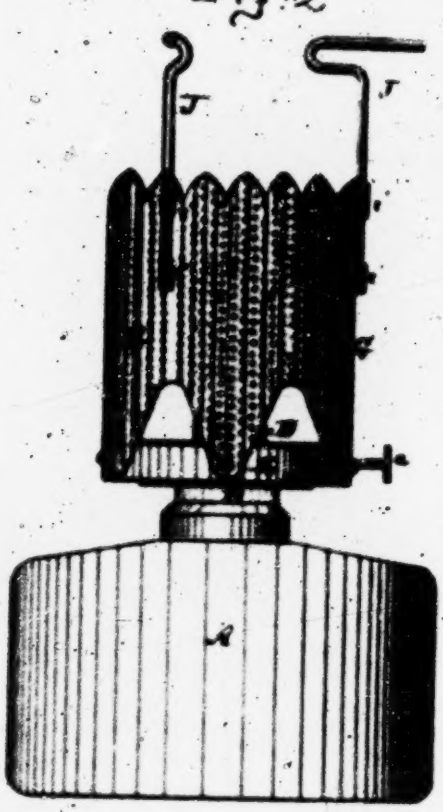


Fig. 2



Witnesses:
A. Briesen
J. Finck

Inventor
Thomas R. Almond
by his attorney
Alex Briesen

UNITED STATES PATENT OFFICE.

THOMAS R. ALMOND, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN VAPOR-BURNERS FOR HEATING PURPOSES.

Specification forming part of Letters Patent No. 198,796, dated August 7, 1877; application filed December 15, 1876.

To all whom it may concern:

Be it known that I, THOMAS R. ALMOND, of Brooklyn, in the county of Kings and State of New York, have invented a new and improved Burner for Heating Purposes, of which the following is a specification:

Figure 1 is a sectional elevation of a lamp carrying my improved burner. Fig. 2 is a side view of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to an improved lamp-burner for heating purposes, the object being to vaporize, by an inner flame, the fuel of the lamp, and to produce a heating-flame by igniting said vapors or other gases.

The invention consists, first, in the combination of a sliding wick-tube, which is moved up and down with the wick through a fixed annular plate, with a top plate, which, when drawn down, serves as an extinguisher.

The invention also consists in providing said annular plate with perforations, or with a perforated rim, and in combining it with a narrow superposed chamber, and with a perforated outer chimney, all as hereinafter more fully described; also, in the use of a hinged cap, and in the new arrangement of brackets for supporting the vessel to be heated.

In the drawing, the letter A represents the reservoir of a coal-oil lamp. B is the wick-tube, and C the wick thereof. The wick-tube is arranged to slide up and down in a hollow guideway, D, that projects from the lamp-reservoir. In this guideway the ratchet-wheel *a*, for moving the wick-tube, has its bearing.

A wooden or other bad heat-conducting base-block, E, is rigidly affixed to the tubular guideway D, and elevated sufficiently far from the reservoir A to keep the flame above from unduly heating the reservoir. This block, together with the tube D, is, by preference, covered with asbestus-paper or other non-combustible substance. The upper end of the stationary tube D terminates in an enlargement or flange, F, in form of an annular plate of slightly smaller diameter than the block E. The plate F has an upwardly-projecting perforated rim, *b*, or is itself perforated.

The wick-tube has an inner cross-bar, *d*, upon which is mounted the vertical stem *e* of a top plate, *f*. This top plate is at a distance above the upper end of the wick, and larger in diameter than the wick, as shown in Fig. 1. By means of the ratchet-wheel *a* the tube B, wick C, stem *e*, and plate *f* are raised or lowered together.

The wick-tube embraces the wick to a short distance from the upper end of the wick. By having a sliding wick-tube I am enabled to raise the flame of the wick to a greater height within the burner without exposing a larger proportion of wick-surface to the action of the flame. The plate *f* serves the purpose of an extinguisher when drawn down upon the plate F.

G is a perforated tube, of a diameter equaling that of the block E. It is, at its lower end, fastened to the periphery of the block E, and extends upward, as shown. To the inner side of this perforated tube is secured the rim *g* of a short tube, H, which surmounts the rim or body of the plate F. The tube H is preferably of smaller diameter than the plate F, and has a connecting step or shoulder, *h*, that joins it to the rim *g*, as clearly indicated in Fig. 1. This shoulder *h* rests on the upper edge of the rim *b*, or directly on the perforated plate F, if the rim *b* is omitted. Shortly above the shoulder *h* the tube H is perforated with holes of considerably larger diameter than the holes of the tube G or rim *b*.

The upper end of the tube H is closed by a hinged cap, I, which can be swung open by hand or by raising the plate *f* against it.

J J are wire brackets placed into sockets *i i*, that are formed by bending and partly cutting the tube G, in manner clearly shown in the drawing. By this construction the brackets are removable and reversible, and yet firmly supported when used.

In use the flame is started by igniting the upper end of the wick and then closing the cap I upon the tube H. The wick-flame burns then in a chamber, H, to which a small proportion of air is admitted through the rim *b* or plate F, and from which gases can freely escape through the comparatively large holes in the tube H. In other words the flame is reduced to the bare possibility of existence, but not entirely stifled, and is thus utilized as a means of vaporizing all that proportion of

fuel which, were it not for the lack of draft referred to, would be directly ignited on the wick.

The vapors thus created, or other combustible gases, escape through the holes of the tube H into the annular space formed between said tube H and the tube G. In this space the vapors or gases meet a supply of fresh air, which reaches them through the apertures of the tube G, and, when ignited, produces a perfect heating-flame, useful for many purposes in the arts. The perforated tube G gives direction to these heating-vapors, and yet admits sufficient air to supply it with the requisite quantity of oxygen.

Experience has shown me that without the tube G the degree of combustion and good heating-flame will not be obtained.

I claim as my invention—

1. The sliding wick-tube B, combined with the cross-bar *d*, stem *e*, and extinguisher-plate *f*, substantially as herein shown and described.

2. The cap I, combined with the chamber, which is formed by the perforated tube H and plate F, substantially as herein shown and described.

3. The perforated tube G, made with sockets *i i*, and combined with the brackets J J, substantially as herein shown and described.

4. The combination of the outer perforated tube G with the inner perforated tube H and connecting-shoulder A, all arranged to constitute a combustion-chamber for vapors or gases that pass through the horizontal perforations of the tube H, above the shoulder A, into the tube G, substantially as specified.

THOS. R. ALMOND.

Witnesses:

ERNEST C. WEBB,

F. v. BRISSEN.

356

(No Model.)

I. E. BLAKE & H. RAUCHFUSS.

HYDROCARBON BURNER.

No. 453,335. Patented June 2, 1891.

Fig. 2.



Fig. 1.



Fig. 4.

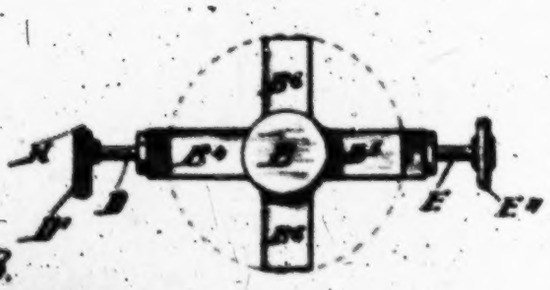


Fig. 3.



Witnesses
Jas. Elliott
Edwin P. Chapman

Inventor
Isaac E. Blake.
Herman Rauchfuss
By Burton and Burton
Attorneys

UNITED STATES PATENT OFFICE.

ISAAC E. BLAKE AND HERMAN RAUCHFUSS, OF DENVER, COLORADO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 453,885, dated June 2, 1891.

Application filed April 17, 1890. Serial No. 348,300. (No model.)

To all whom it may concern:

Be it known that we, ISAAC E. BLAKE and HERMAN RAUCHFUSS, citizens of the United States, residing at Denver, county of Arapahoe, and State of Colorado, have invented certain new and useful Improvements in Hydrocarbon Illuminating Burners, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

Figure 1 is a side elevation of our improved burner. Fig. 2 is a vertical axial section through the line 2 2 on Fig. 3, said Fig. 3 being a plan with the shield removed. Fig. 4 is a section at 4 4 on Fig. 1.

This application is for an invention related to another invention for which our joint application, Serial No. 348,301, is filed simultaneously herewith, and we do not design in this application to claim specifically anything which is shown in the other application above named.

This invention is designed to facilitate the use of hydrocarbon oils for illumination, and is adapted for use with the lighter and more volatile oils—such as naphtha or gasoline—which vaporize at a moderate heat.

It consists in improved devices whereby a minimum flame is maintained and protected from extinguishment and converted into a maximum flame when desired. The devices employed are designed also to make the maximum flame consist of radiating jets rather than a continuous integral flame.

In the drawings, A is the supply-tube and vaporizing-chamber, which is filled with any suitable absorbent and porous substance A', which checks the flow of the fluid to the burner and retains the heat after the burner is lighted, causing the fluid which is conducted into it to be vaporized in its pores. The tube or stem A is cast in one piece with or brazed at the upper end to the burner-tip B. Two ducts B' and B² extend through the burner-tip from the chamber in the stem A to the spreading-chamber B³, formed in the upper end of the burner-tip B. This spreading-chamber might properly also be called a "vaporizing-chamber," since before the burner becomes hot enough to cause the formation of vapor in the stem A the liquid will be vaporized in this spreading-chamber B³. Fine orifices b^3 lead from the chamber B³ through its wall outwardly, said orifices being arranged in a horizontal plane discharging radially from the chamber, and through them the vapor is discharged in jets and is ignited on the outer side of the chamber. The tip B is formed with four radial arms B^4 B^5 B^6 B^7, extending horizontally from its base, and we provide the shield C, so named from its function, as hereinafter explained, which is a hollow cylinder having an opening through its base large enough to allow it to be passed down over the upper end of the burner-tip, and which rests upon the four radial arms B^4 B^5 B^6 B^7. The base C' of the shield C is perforated, said perforations c' being distributed over its entire surface and designed to admit air freely into it from below. Its cylindrical wall is pierced by apertures c^3, equal in number and in line radially with the orifices b^3, respectively leading from the spreading-chamber B³.

Through the arms B^4 and B^5 holes are drilled into the ducts B' and B², respectively, and screw-valves D and E, suitably guarded about their stems with stuffing-boxes D' and E', are provided, entering through said holes and seating across said ducts B' and B², respectively. Directly above each of these valves simple screw-valves F and G are inserted through the arms D^4 and D^5, respectively, and seated in and adapted to close the ducts B' and B², respectively, above the seats therein of the valves D and E, respectively. These latter valves F and G are preferably made with slender tapering points, and their seats are of course similarly formed, whereby they are adapted to be very accurately adjusted. The valves D and E may not be so slender, but may cease more abruptly. The valve D we prefer to provide with a sheave-handle D', to which a chain H may be connected for convenience in operating it. The valve E may have no handle at all, or may be provided with a handle E'', as shown; but the valves F and G are preferably without handles, but may be slotted at the exposed ends to be operated by a screw-driver. These latter valves are designed to be so tightly fitted in their threads as to require no stuffing-boxes, and to be adjusted not too easily even by means of a screw-driver, and incapable of adjustment by the fingers without a tool.

This burner is designed to be used in the following manner: The valve E being closed and the valves F and D being open and the valve G either open or closed, it being at this stage a matter of indifference whether it is open or closed, the fluid admitted through the pipe A and contained in the porous material A' flows up through the duct B', and, overflowing in the chamber B^3 and flowing out through the orifices b^3, will be ignited upon the outside of the burner-tip. It will be understood that for this purpose the shield C may be temporarily removed. The valve D may now be closed, or so nearly closed as to admit a very slight quantity of oil past it, the oil which has overflowed and such additional quantity, if any, as may be supplied past the valve D burning freely until the entire burner-tip B and the tube A, connected to it, are sufficiently heated to cause the fluid contained in the porous contents A' of the tube A to be vaporized therein, so that the discharge from the orifices b^3 is no longer oil, but vapor. It will be understood that if the valve D has been closed entirely after the first discharge of oil past it, as described, it must be opened again before the oil so discharged is entirely burned up, in order that the vapor or vaporized oil in the tube A may be admitted to the burner-tip to maintain the flame. The valve D will now be opened wide, and the valve F will be screwed in until the discharge of vapor past it is limited to such amount as can be continuously generated in the chamber A. This amount and the consequent adjustment of the valve F will be determined by the judgment of an expert or by sufficient experiment to ascertain it reliably, and the valve F, having been once set at this position, need never be changed, except when a different grade of oil is to be used, which may change the conditions. The valve D being now closed entirely, and the valve E opened wide, the valve G will be adjusted to such position that it will admit past it only the least quantity of vapor, which will maintain the temperature of the burner at the vaporizing-point. This valve, being thus adjusted, will need no change unless a different character of oil is to be used, which may require a greater volume to maintain the same temperature, or which vaporizes at a different temperature. It will be seen that when the valves F and G are thus adjusted the flame may be increased from the minimum which can be maintained to the maximum that the burner is capable of supplying reliably by opening the valve D to any desired extent, and that, once lighted and properly adjusted, the flame will never be extinguished entirely, and the burner may therefore be operated with as great convenience as a burner fed by a gas-supply and provided with automatic lighting attachments, so that the process of first flooding the burner with oil and watching it until it begins to vaporize and then with care requiring an expert adjusting it to the proper point each time it is used is dispensed with. If at any time it is desired to extinguish the burner entirely, as when the light is not to be required for a long time, as for several days or weeks, the valve E will be closed as well as the valve D; but in the ordinary intervals of use from night to night the valve E will be left open and the flame maintained at the minimum, controlled by the valve G, as described.

It will be apparent that the slight flame formed when the valve D is closed and the vapor is admitted only past the minimum valve G would be liable to be extinguished by drafts of air, and also that the large flame might be rendered unsteady and might be extinguished at some of the orifices momentarily by air-blasts accidentally directed upon it if no protection were afforded for the flame. To afford such protection is the purpose of the shield C. This shield has the bottom C' perforated, as already described, the intention being to admit an abundant supply of air to the flame, but to so thoroughly break it up that it shall be distributed evenly and not at any time reduced to a blast at any one point. The shield entirely encircles the burner-tip and is closed at the top, and has the apertures c^3, which are radially in line with the apertures b^3 in the burner-tip B. The apertures c^3, however, are very much larger than the orifices b^3, the latter being from one one-hundredth to one-fiftieth of an inch—that is, barely large enough to admit a fine needle—while the former—the apertures c^3—are from three-sixteenths to three-eighths of an inch in diameter. The jets emitted from the orifices b^3 are directed toward the apertures c^3, and when the supply-valve is opened to such an extent as to produce actual illumination from the burner these jets shoot out through the apertures c^3. When the burner is turned down—that is, when the valve D is closed, or nearly so—and the quantity of vapor admitted is that which is permitted by the valve G, the jets barely protrude from the orifices b^3, or at least do not extend far enough to be visible outside the shield C. In practice a bare blue point of flame is visible at the orifices b^3 when the supply of vapor is at the minimum as controlled by the valve G.

We claim—

1. In a vapor-burner, in combination with the fluid-supply pipe and the burner-tip and a duct communicating from the supply-pipe to the tip, and the valve controlling such duct, the tip having peripheral jet-orifices in horizontal plane, through which the vapor is emitted radially, and a shield encircling and covering such tip and having peripheral openings in a horizontal plane radially in line with the jet-orifices, respectively, and through which the flame can extend when the controlling-valve is sufficiently opened, substantially as set forth.

2. In a hydrocarbon-burner, in combination with the supply-pipe and the burner-tip,

two ducts which communicate with the supply-pipe and the tip, a limiting-valve seating in each of said ducts, one of such valves being adjusted to the minimum and the other to the maximum of the desired supply, the third valve controlling the duct which has the maximum limiting-valve, the burner-tip having peripheral jet-orifices in horizontal plane, through which the vapor is emitted radially, and a shield C, encircling and covering such tip and having in a horizontal plane peripheral flame-orifices c^2, which are radially in line with the jet-orifices, respectively, whereby the jets of flame emitted from the jet-orifices are caused to extend out separately and divergently in a horizontal plane through said flame-orifices, substantially as set forth.

3. In a vapor-burner, in combination with the burner-tip having jet-orifices located in a horizontal plane and discharging radially, a shield encircling and covering such tip and inclosing a chamber between the tip and the shield, the latter having peripheral apertures in a horizontal plane in line radially with the jet-orifices, respectively, and larger than the latter, whereby the flame formed at the jet-orifices is shielded from exterior currents of air until it is emitted through the shield-apertures, substantially as set forth.

In testimony whereof we have hereunto set our hands, in the presence of two witnesses, at Denver, Colorado, this 11th day of April, 1890.

ISAAC E. BLAKE.
HERMAN RAUCHFUSS.

Witnesses:
C. B. COWELL,
M. MCMULLIN.

PAGES - 360

AND 361 ARE

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362

No. 783,339. PATENTED FEB. 21, 1905.

W. P. WARREN.

VAPOR LAMP.

APPLICATION FILED APR. 6, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

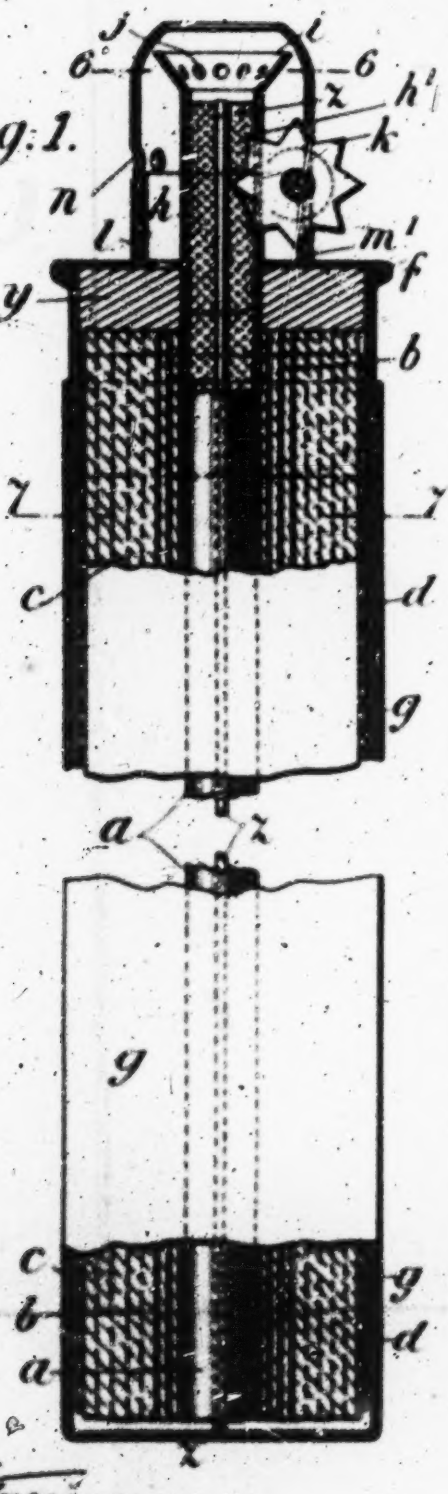


Fig. 2

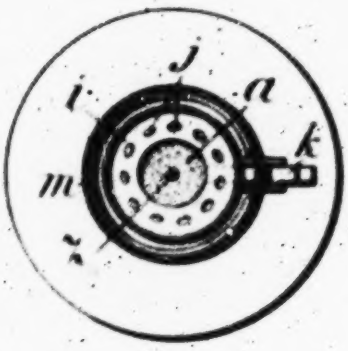
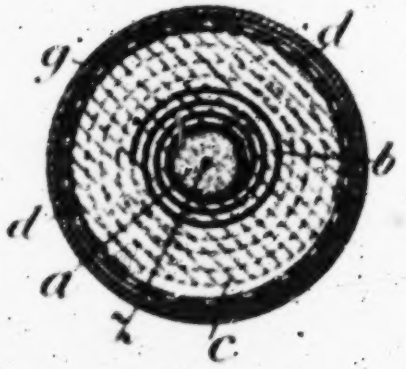


Fig 3



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by Wilkinson & Fisher
his attorneys

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No. 783,339. PATENTED FEB. 21, 1905.

W. P. WARREN.

VAPOR LAMP.

APPLICATION FILED APR. 6, 1904.

3 SHEETS—SHEET 2.

Fig 4.

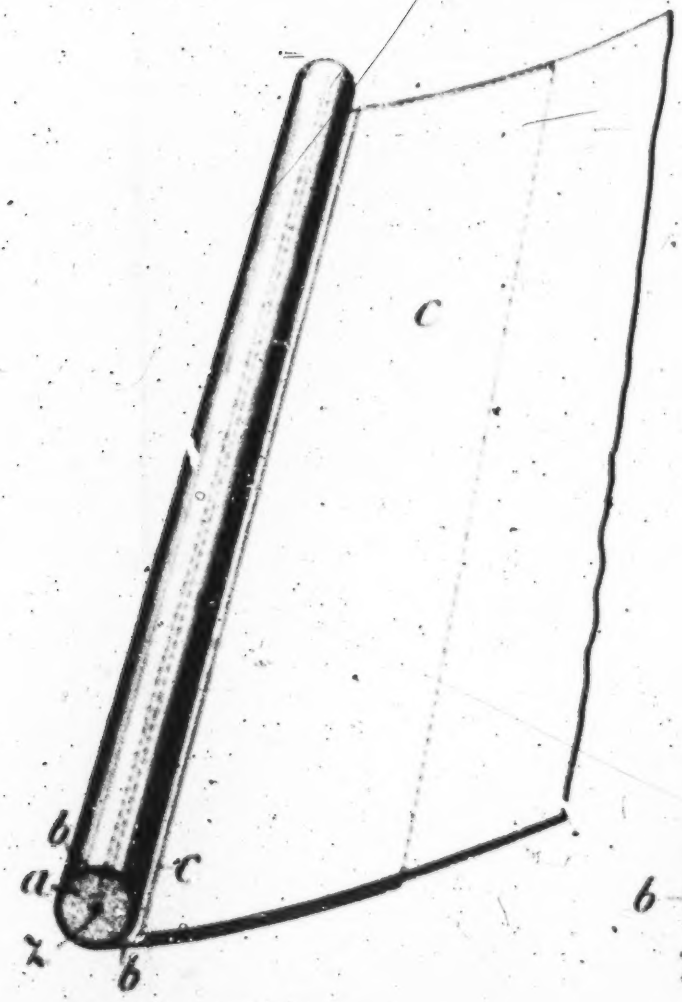


Fig 5



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366

No. 783,35[illegible]

PATENTED FEB. 21, 1905.

W. P. WARREN.

VAPOR LAMP.

APPLICATION FILED APR. 8, 1904.

[illegible] SHEETS—SHEET 1.

Fig 6.

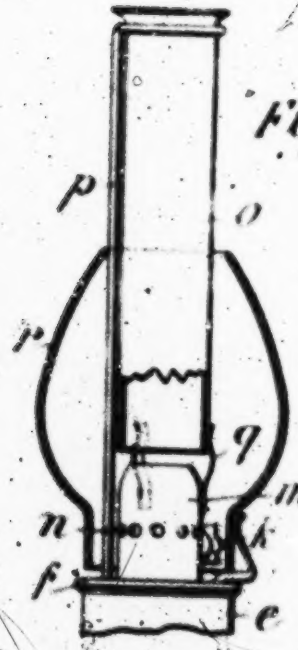
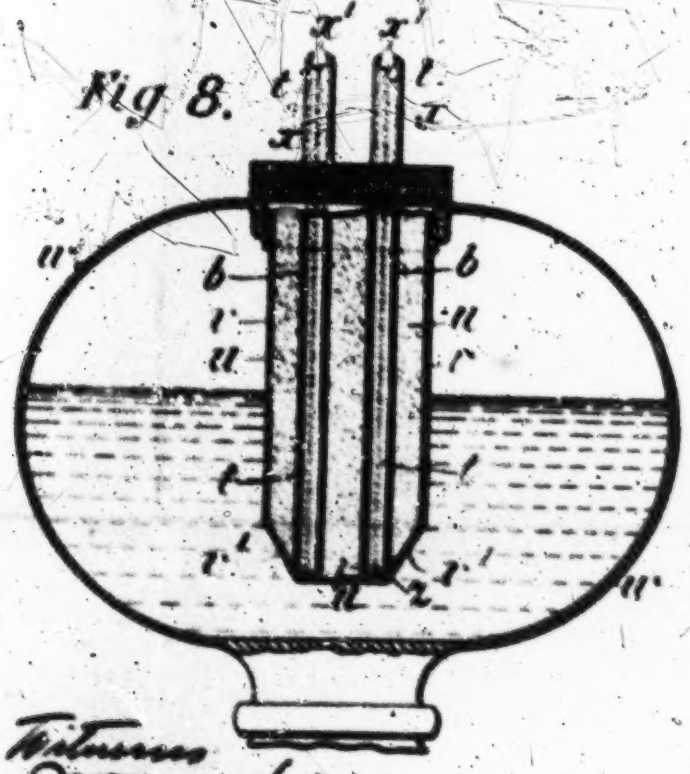


Fig. 7.



Fig 8.



Witnesses
J. Stephen Kinsta
M. Mae Dunell

Inventor
W. P. Warren
by Dickinson & Fox
his Attorneys

No. 783,339. Patented February 21, 1905.

UNITED STATES PATENT OFFICE.

WALTER P. WARREN, OF LONDON, ENGLAND, ASSIGNOR OF TWO-THIRDS TO JAMES CHARLES PAIN, JR., AND ALBERT ESCOLME, OF LONDON, ENGLAND.

VAPOR-LAMP.

SPECIFICATION forming part of Letters Patent No. 783,339, dated February 21, 1905.

Application filed April 6, 1904. Serial No. 201,926.

To all whom it may concern:

Be it known that I, WALTER PELHAM WARREN, engineer, a subject of the King of Great Britain, residing at 525 Holloway road, London, England, have invented certain new and useful Improvements in Vapor-Lamps, of which the following is a specification.

This invention relates to lamps and burners using liquid hydrocarbons; and the objects of this invention are (*inter alia*) to provide a lamp and burner which will minimize the risks attendant on the use of liquid hydrocarbons either from the leakage of the liquid through the various parts when the lamp or burner is in any other than a vertical position or from the gaseous vapors in the body of the lamp coming into contact with flame, and so causing an explosion; to provide a burner which may be employed with or without a forced draft, which automatically vaporizes the liquid, and which is free from liability to be extinguished by vibration or jar, such as is commonly experienced on ordinary road and other vehicles; to simplify the means of manipulating the wick, and to insure an even and constant supply of hydrocarbons at the point of combustion so long as any remain in the reservoir, but irrespective of the quantity of such liquid which may be in the reservoir.

In the accompanying drawings, Figure 1 is a view of the lamp and burner, the parts being shown in vertical section. Fig. 2 is a horizontal cross-sectional view through the burner part of the lamp on the line 6 6, Fig. 1. Fig. 3 is a horizontal cross-sectional view on the line 7 7, Fig. 1. Fig. 4 is a perspective view showing the absorbent filling in the act of being rolled round the wick. Fig. 5 is a perspective view of the absorbent filling rolled completely round the wick, ready for insertion in the perforated chamber. Fig. 6 is an exterior view of the burner and top part of the lamp, showing the arrangement of chimney and globe. Fig. 7 is similar view to Fig. 6, but showing a chimney with enlargement at the lower end thereof which may be used in place of a cylindrical chimney and globe, as in Fig. 6. Fig. 8 shows a modified arrangement wherein the absorbent filling is arranged in a cylinder or chamber which is only perforated or porous at the lower end thereof, and such chamber and absorbent filling is used in the position shown—viz., immersed in the reservoir containing the liquid hydrocarbons—this Fig. 8 showing a further modification—namely, two flat wicks (or a circular wick can be employed, if desired, with this reservoir arrangement)—the upper part—*i. e.*, the burner portion—being removed, same being of any suitable construction—such, for example, as the ordinary form of duplex burner, with two flat wicks.

I will first of all describe my invention with reference to the accompanying drawings as carried into practice with a circular-wick lamp.

a is circular wick, which in the case illustrated is shown as a circular core of wick material—*i. e.*, non-tubular—and in this wick I insert from end to end thereof a metal core or strip *z*, advantageously in the form of a copper wire, (which I will hereinafter refer to as the wire *z*,) the length of this wire *z* being such that at its lower end it will rest on the bottom of the lamp or bottom of the case inclosing the absorbent filling, while the upper end will extend to the top of the wick or just above same—*i. e.*, this wire extends up to the point of combustion, or thereabout—and though relative longitudinal movement is possible between the wick *a* and the wire *z* nevertheless such relative movement cannot easily take place. Thus as the wick burns away or becomes reduced in length then when the wick is raised by the star-wheel *k* (or by any other suitable means) the wire *z* is pushed down by the operator until said wire *z* rests or bears against the bottom of the aforesaid casing or reservoir, and thereafter any shaking, jolting, or vibration of the lamp (to which same is ordinarily liable to be subjected) will not cause the wick to descend, as with the assistance of this wire *z*, thus located the wick is firmly held in any position to which it is adjusted, as aforesaid. Round this core of wick material forming the wick *a* I then roll or place one complete lap or winding of blotting-paper or the like close-grained absorbent

b, (see Figs. 4 and 5,) so that said wick *a* is completely surrounded by blotting-paper *b* or the like close-grained absorbent, hereinafter referred to as "blotting-paper," and I then commence to roll or place flannel or the like open-grained absorbent material *c* next to the blotting-paper and roll about three or four laps or windings of said alternate layers of blotting-paper *b* and flannel *c*, and after these four or five laps of blotting-paper, alternating with layers of flannel, no more blotting-paper is used, and the windings are continued with flannel only or the like open-grained absorbent *c* (hereinafter referred to as "flannel") until the desired diameter or size of absorbent materials is arrived at, whereupon this roll (of absorbent materials *a*, *b*, and *c*) is now inserted in a perforated case, such as the cylindrical perforated chamber *d*, which perforated tube or chamber *d* is open at both its top and bottom ends, such tubular chamber *d* being advantageously brazed or otherwise fixed to the short downwardly-extending tubular portion *e* of the cap *f*, which supports the burner. *g* is the outer case, consisting of the solid walled cylindrical tube *g*, closed at its bottom end, and at its upper end said outer casing or envelop *g* is adapted to slide over and fit closely the tubular part *e* of said cap *f*. The oil absorbing and holding device thus formed and consisting of the wick *a* and layers of absorbent materials *b* and *c* in the perforated tube *d* I for convenience sake may term the "cartridge," from which the wick can be readily removed when desired and replaced again or replaced by a new wick of corresponding form and size, and to charge this cartridge with a supply of oil all that it is necessary to do is to slide off the outer casing *g*, then dip the cartridge for a moment in any suitable liquid hydrocarbon in any suitable vessel or holder, whereupon the absorbent material will quickly become fully charged with the liquid hydrocarbons, and the cartridge is then lifted out of the liquid (allowed to drain for a moment) and then replaced in its casing *g* and is again ready for use. The casing *g* may be secured and retained in position on the cap *f* by any suitable means. The burner for use with this round-wick cartridge is as follows: On the cap or top *f* of the cartridge there is fixed the wick-tube *h*, the bottom end of which advantageously extends a short distance below the cap *f*, so as to enter the cartridge, and at its upper end this wick-tube *h* is flared or bell-mouthed or provided with a conical top portion, such as *i*, which latter has a ring of perforations *j* provided therein, and between such flared top *i* and cap *f* this wick-tube *h* is slotted at *h'* to enable the points of the star-wheel *k* to enter the wick *a* for the purpose of raising or lowering the latter, this star-wheel *k* being a convenient device for raising or lowering the wick; but obviously any other equivalent or suitable means may be employed for this purpose.

l is a support fixed to the cap *f* to form a seating for the hood *m*, over which support *l* the hood *m* is adapted to fit down stiffly, so as to be held firmly thereon in position during the burning of the lamp and protect the flame from gusts of air and the like. This hood *m* is open at its top end and is provided with a ring of apertures *n*, located about midway of the height of said hood *m*, so as to permit an adequate supply of air to pass upward between the outside of the wick-tube *h* with flared top *i* and the interior of said hood, and thus form an efficient air-supply for the flame, said hood *m* being slotted at *m'* to permit same to fit down over the star-wheel *k*, part of which star-wheel *k* thus projects through said hood *m* to enable the wick to be raised or lowered by such star-wheel *k* without removal of the hood *m*. The star-wheel *k* may be provided with a shaft and milled head thereon to rotate in the usual manner, if desired. Any suitable chimneys may be used in conjunction with this burner; but where a chimney and globe are employed, as in Fig. 6, the chimney *o* must be supported slightly above the top of the hood *m*, so as to afford access of air over the top of said hood *m* to the flame issuing therefrom, such chimney *o* being mounted in any suitable manner—for example, by the support *p* and the spring-guides *q*—the globe *r* being mounted in a gallery of the usual or any suitable type of a character adapted to admit air at the lower part of said globe.

In Fig. 7 no globe is shown, the chimney *s* being formed with an enlargement *s'* at the lower part thereof and is supported in a gallery in about the position shown, so that air admitted at the lower end of said chimney can pass upward over the top of said hood *m* and also pass to the interior of said hood *m* through the apertures *n*, as before.

In Fig. 8 each of the two flat wicks are surrounded by blotting-paper *b*, and outside of this blotting-paper there is packed any suitable absorbent material *u*, the whole being contained in the case *v*, the lower portion only of which is perforated—namely, at *v'*—which perforated portion is immersed in the liquid hydrocarbon contained in any suitable lamp-reservoir *w*.

A wire or wires *z* is inserted in each flat wick, and such wicks when provided with wires capable of longitudinal movement in relation to such wicks and of such a length that they reach from just below the flame to the bottom of the oil-container are even without any absorbent envelop of great use in that they prevent the wicks dropping into the container if turned down too low, and such wicks can be much more easily inserted into the wick-tube than if without the wires, and

the heat conductivity of the wires tends to assist vaporization of the oil.

The wick-tubes *x* for table-lamp purposes may be "straight-through" tubes in the ordinary way, or for the purpose of lamps burning without a chimney—such as van-lamps, hand-lamps, &c.—the top ends of the wick-tubes *x* may be turned inward, as shown at *x'*, Fig. 8, and each end of said flat-wick tubes in such case are advantageously cut away. This arrangement of inturned edge or flange *x'* at the top of the wick-tubes *x* may, if desired, be provided by forming said inturned edges *x'* on removable caps, the latter being adapted to slide over the wick-tubes, on which they fit down tightly.

It will be obvious that, if desired, the circular-wick burner, as herein described, may be employed independently of the cartridges *a b c d* and wire *z*—as, for example, such burner may be employed with an ordinary circular wick immersed in a body of hydrocarbon liquid in the lamp-reservoir in the ordinary way. Also it will be obvious that the aforesaid cartridges *a b c d* and wire *z*, constructed according to the present invention, may be employed with other than the precise form of burner described and illustrated, as although I have described and set forth the best forms of burner at present known to me for use in conjunction with such cartridge, nevertheless it will be obvious that any other suitable burner may be used, if desired, in conjunction with said cartridge, as aforesaid.

If desired, any suitable heat-non-conducting or insulatory material may be inserted or employed between the burner and the body or cartridge to prevent or reduce heat being conveyed from the liquid hydrocarbons in the absorbent material. For example, a washer or packing *y* of heat-insulating material, such as asbestos, may be inserted inside the top of the perforated chamber close under the cap *f*.

In forming the cartridge by rolling the two absorbent materials round the wick or round a templet corresponding to the wick *a* or corresponding to the flat wicks (as the case may be) care must be taken that this is done in such wise that the circular wick *a* (or other shaped wick, as the case may be) may be readily slid in or out of the interior space thus formed in the roll of absorbent materials *b* and *c* or other absorbent, as the case may be. It will also be obvious that, if desired, the layers of absorbent material may be placed in position round the wick (whether the latter be circular or otherwise) in other ways than by rolling or winding such absorbent materials, as aforesaid, although I consider the rolling or winding of such materials to be the simplest and easiest way to form these cartridges.

From the foregoing description it will be obvious that the wick and the absorbent materials are and must be in contact with one another or arranged in such wise that the oil held in these various absorbent materials can all (or practically all) pass readily and evenly from all parts of said absorbent materials to the point of combustion as and when required, and in practice I have found that the oil is by these means supplied for combustion in a very steady and regular manner right up to the last.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a layer of fine-grained material surrounding said wick, and a layer of coarse-grained material surrounding said fine-grained material, in combination with means for isolating the ignition-surface of said wick from said latter-named elements, substantially as described.

2. In lamps for burning liquid hydrocarbons, a device supplying oil comprising a wick, a layer of close-textured fabric surrounding said wick and a layer of loose-textured fabric surrounding said close-textured fabric in combination with means for isolating the ignition-surface of said wick from said latter-named elements, substantially as described.

3. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a piece of fine-grained material wound spirally about said wick, a piece of coarse-grained material wound spirally between the layers of said fine-grained material and a further winding of coarse-grained material outside of said spiral windings, substantially as described.

4. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a layer of fine-grained material surrounding said wick, and a layer of coarse-grained material surrounding said fine-grained material, the whole wound upon a metal core, in combination with means for isolating the ignition-surface of said wick from said coarse and fine grained materials, substantially as described.

5. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a layer of fine-grained material surrounding said wick, and a layer of coarse-grained material surrounding said fine-grained material, means for isolating one end of said wick from said latter-named elements, a perforated wall surrounding said oil-supplying device, and a suitable vessel for containing the same, substantially as described.

6. In lamps for burning liquid hydrocarbons, a device supplying oil comprising a wick, a layer of close-textured fabric surrounding said wick and a layer of loose-textured fabric surrounding said close-textured fabric, means for isolating one end of said wick from said latter-named elements, a perforated wall sur-

rounding said oil-supplying device, and a suitable vessel for containing the same, substantially as described.

7. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a layer of blotting-paper surrounding said wick, and a layer of flannel surrounding said blotting-paper, means for isolating one end of said wick from said latter-named elements, a perforated tube surrounding said flannel, and a suitable vessel in which the whole is placed, substantially as described.

8. In lamps for burning liquid hydrocarbons, a suitable outer casing, a perforated tube constructed to fit loosely therein, a device for supplying oil within said tube comprising a wick, a layer of fine-grained material surrounding said wick and a layer of coarse-grained material surrounding said fine-grained material, and a metal core within said wick constructed to have a bearing upon the bottom of said outer casing, substantially as described.

9. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a plurality of alternate layers of blotting-paper and flannel surrounding said wick, the whole wound upon a metal core and placed within a suitable inclosing casing, in combination with means for isolating the ignition-surface of said wick from said blotting-paper and flannel, substantially as described.

10. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, and a roll comprising alternate layers of fine and coarse grained material wound loosely thereon whereby said wick is capable of a longitudinal movement within said layers, substantially as described.

11. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a roll comprising alternate layers of fine and coarse grained material wound loosely thereon whereby said wick is capable of a longitudinal movement within said layers, and a metal core for said wick whereon the same is guided in its movement, substantially as described.

12. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a roll comprising alternate layers of close and loose textured fabric wound loosely thereon whereby said wick is capable of a longitudinal movement within said layers, and a metal core for said wick whereon the same is guided in its movement, substantially as described.

13. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a layer of fine-grained material surrounding said wick, and a layer of coarse-grained material surrounding said fine-grained material, a perforated tube surrounding said device and the whole inclosed in a suitable casing, an apertured wick-tube extending above the wick provided with a bell-mouth and a projecting hood inclosing said wick-tube at a distance therefrom provided with an open top and perforated sides, substantially as described.

14. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, a layer of blotting-paper surrounding said wick, and a layer of flannel surrounding said blotting-paper, a perforated tube surrounding said device and the whole inclosed in a suitable casing, an apertured wick-tube extending above the wick provided with a bell-mouth, and a projecting hood inclosing said wick-tube at a distance therefrom provided with an open top and perforated sides, substantially as described.

15. In lamps for burning liquid hydrocarbons, a device for supplying oil comprising a wick, and a roll comprising alternate layers of fine and coarse grained material surrounding said wick, the whole wound upon a metal core and placed within a suitable inclosing casing, an apertured wick-tube extending above the wick provided with a bell-mouth, and a projecting hood inclosing said wick-tube at a distance therefrom provided with an open top and perforated sides, substantially as described.

16. In lamps for burning liquid hydrocarbons, a wick and burner therefor comprising a wick-tube adapted to surround the upper part of said wick and extend above the top of it, an outwardly-sloping apertured flange forming a bell-mouth at the top end of the wick-tube, a hood inclosing said top part of the wick-tube, extending above it, and having an air-passage between the outside of said top part of the wick-tube and the inside of the hood, said hood provided with holes to admit air to the inside thereof, substantially as described.

17. In lamps for burning liquid hydrocarbons, a wick and burner therefor comprising a wick-tube adapted to surround the upper part of said wick and extend above the top of it, an outwardly-sloping apertured flange forming a bell-mouth at the top end of the wick-tube, an open-topped hood inclosing said top part of the wick-tube, extending above it, and having an air-passage between the outside of said top part of the wick-tube and the inside of the hood, said hood provided with holes to admit air to the inside thereof, and a chimney adapted to cause or permit the convergence of air onto the outside of the flame as it rises above the central aperture at the top of the hood, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WALTER P. WARREN.

Witnesses:
HENRY BIRKBECK,
H. D. JAMESON.

372

J. F. RUTZ & J. K. LUETHE.

IGNITER TORCH FOR GAS BURNERS.

APPLICATION FILED MAY 29, 1911.

1,009,184. Patented Nov. 21, 1911.

Fig. 1.

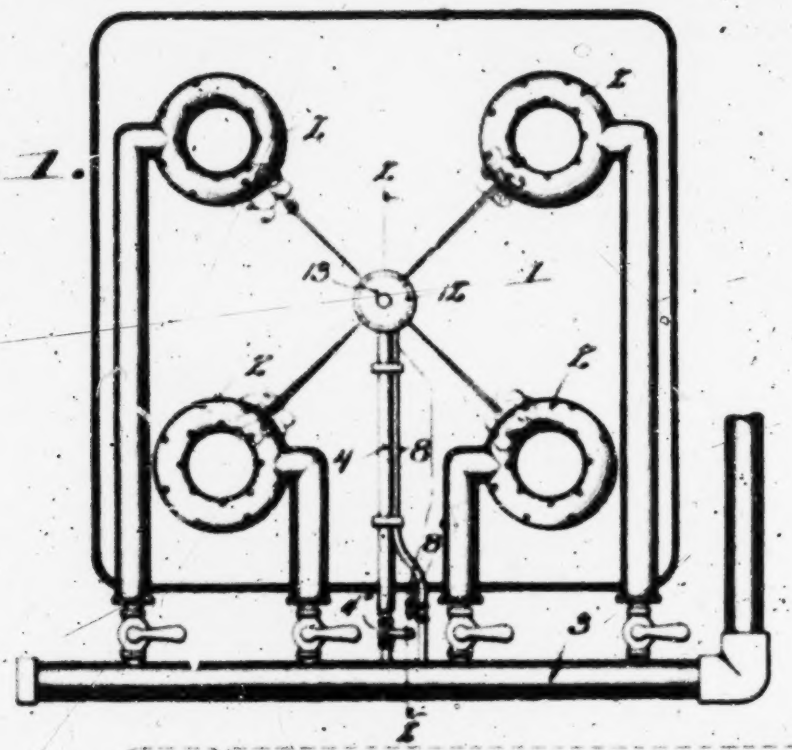
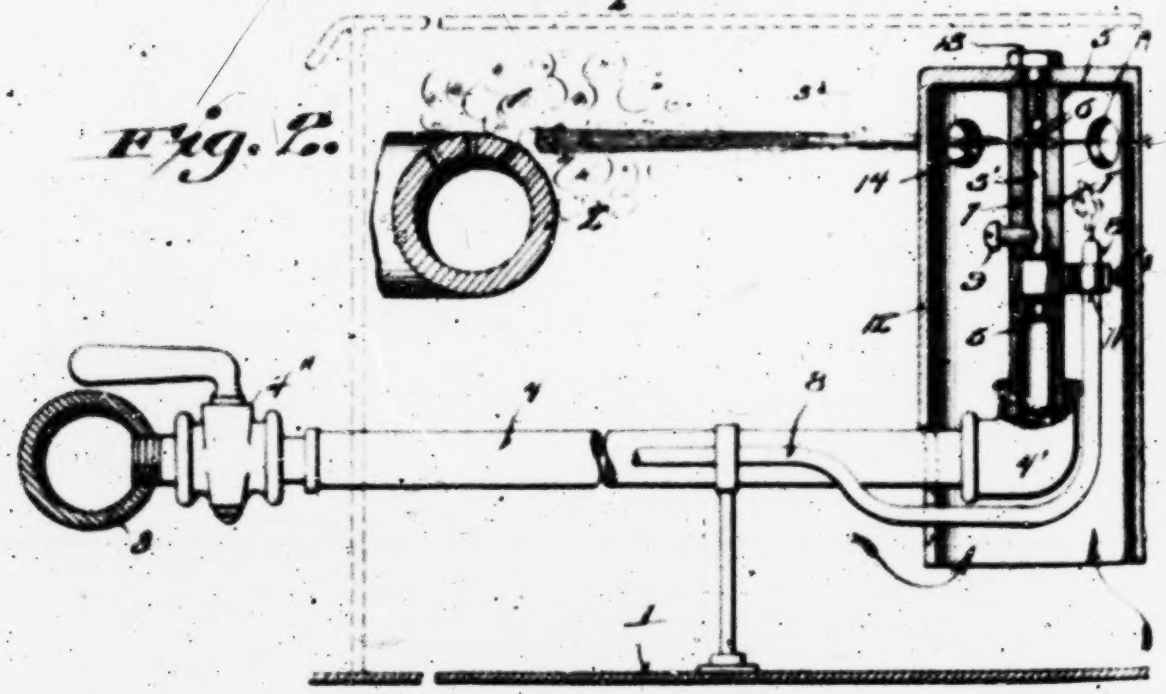


Fig. 2.



Witnesses:
Clarence Young
May Bowers

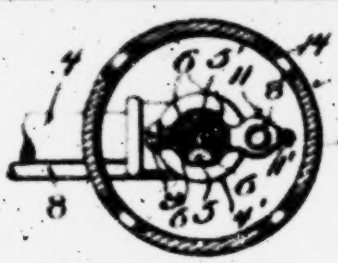


Fig. 3.

Inventors:
Julius F. Rutz
Julius K. Luethe
by Clifford A. Young
Attorney

UNITED STATES PATENT OFFICE.

JULIUS F. RUTZ AND JULIUS K. LUETHE, OF MILWAUKEE, WISCONSIN.

IGNITER-TORCH FOR GAS-BURNERS.

1,009,184. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed May 20, 1911. Serial No. 628,118. REISSUED

To all whom it may concern:

Be it known that we, JULIUS F. RUTZ and JULIUS K. LUETHE, both citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, post-office address 812 Brennan street, have invented certain new and useful Improvements in Igniter-Torches for Gas-Burners; and we do hereby declare that the following is a full, clear, and exact description thereof.

The primary object of our invention is to provide a simple, economical and effective igniter torch for gas burners.

Specific objects are to provide a single torch about which a series of valve-controlled burners are grouped within the zone and upon a plane common to individual jet flames that are discharged simultaneously from the torch; to provide a torch head incased within an apertured bell, the apertures being alined with corresponding restricted gas-supply apertures in the torch head; to provide a constant pilot light within the bell whereby the various torch head gas-discharge apertures are simultaneously ignited, the bell forming an air shield for the pilot light whereby cross-currents of air due to exterior disturbances will not snuff out said pilot light, and to provide means whereby the air for the supply of oxygen to the torch flames and pilot light is received from a lower strata than that which supplies the burners, it being well known that ignited burners will consume practically all of the oxygen in the air thereabout and thus reduce the efficiency of a centrally located constant flame.

With the above objects in view our invention consists in what is herein shown, described and claimed.

In the drawings Figure 1 represents a plan view of a gas stove provided with a torch embodying the features of our invention; Fig. 2 an enlarged partially sectional elevation of the torch and its connection, the torch being shown located within a stove which is indicated in dotted lines and having the bottom compartment in full lines and in sections, there being a cross section of a portion of a burner located upon its proper plane relative to the igniter torch. The section of the igniter torch being indicated by line 2—2 of Fig. 1. Fig. 3, a detail sectional plan view of the torch, the section being indicated by line 3—3 of Fig. 2.

Referring by characters to the drawings, 1 represents the bottom of the burner compartment of a stove, the front wall and skeleton top grid of which stove is illustrated in dotted lines. The stove is provided with a series of burners 2 under suitable valve-control and supplied with gas from a main pipe 3 in the ordinary manner. The branch pipe 4 having a valve 4'' is connected to the main pipe 3, said branch pipe being extended into the burner compartment, where it terminates approximately at the center of the same and about which point the burners 2 are conveniently grouped. Coupled to the branch-pipe 4 by an elbow 4' is a vertically disposed torch-head 5, which torch-head is provided with a longitudinal channel 5' and terminates upon a plane slightly below the top grid. The torch-head is also provided with a radially disposed gas-discharge aperture 6 for each burner, the apertures being disposed upon approximately the same horizontal plane as the burners whereby the latter are each within the zone of an individual jet flame that is emitted from the gas-discharge apertures of said torch-head when a supply of gas is admitted thereto.

The torch-head has one or more leak apertures 7 below the gas discharge aperture 6, the leak apertures being staggered in their horizontal plane relative to the plane of the gas-discharge apertures whereby the latter are readily ignited, it being understood that gas from the leak-apertures is ignited by a constant burning torch-nozzle 8, the mouth of which is in juxtaposition thereto but upon a lower plane.

The supply of gas to the various torch-head apertures is regulated by a valve-plug 9 that is in threaded union with an opening which intersects the torch head channel 5', the plug being below the discharge and leak apertures respectively and is adjusted to effect the desired control of gas thereto. The torch-nozzle 8 is formed from a small tube or pipe that communicates with the main supply-pipe 3 and adjacent to its junction therewith, is equipped with a cut-off valve 8', which, under ordinary conditions, is open, whereby gas is supplied in small quantities to the constant pilot flame. The end of the torch-nozzle is made fast to the

torch-head by its engagement with an apertured clip 11 and should it be desired to adjust the mouth of said nozzle relative to the leak apertures said adjustment can be effected by springing the pipe 8 up or down so as to change the position of the mouth of the same relative to the leak-aperture and thereafter the said pipe is secured within the clip by a set-screw 11' that is in threaded engagement with the clip.

The torch-head 5 and pilot-light nozzle 8' are incased in a bell 12, the top of which is secured to the upper end of said torch-head by a cap-screw 13 that is in threaded engagement with the torch-head channel 5' whereby the same is closed. The bell 12 is provided with a series of vent-holes 14, there being one for each gas-discharge aperture. These vent-holes are of considerably larger area than the discharge apertures and are in radial alinement therewith whereby flames emitted from said apertures are directed upon the various burners to cause ignition of the latter when their valve-controlled gas pipes are opened.

It is apparent from the foregoing description that in the operation of the torch the valve 8' of the pilot-light is normally open, whereby a small flame is constantly maintained within the bell and, owing to its inclosed position, liability of the same to be inadvertently blown out is practically eliminated. When it is desired to ignite one or all of the burners grouped about the torch the supply of gas thereto is admitted by operating their individual cocks and thereafter the valve 4'' which controls the gas-supply pipe 4 leading to the torch-head is opened. Gas will then pass out through the discharge aperture 6 and also the leak aperture 7, being slightly pocketed or confined within the top of the bell and simultaneously the torch nozzle 8' will ignite this supply of confined gas causing a slight explosion which, in turn, will ignite the gas from the discharge apertures 6 and the flame from each of said apertures will be flashed through the vent-holes of the bell and directed upon the various burners whereby they, in turn, will be ignited. It is apparent that should only one of the burners be open to the supply of gas no effect upon the remaining burners will be had. Attention is also called to the fact that the air for the supply of oxygen to the torch is drawn in through the space between the mouth of the bell and the bottom 1, the intake of air being thus upon a considerably lower plane than the burners, the supply of sufficient oxygen for the torch is insured and furthermore the bottom of the bell being in juxtaposition to the bottom plate 1 said bell will effectually shield the pilot-light from the disturbing influence of cross-currents of air. It will be observed that the horizontally alined vent-holes of the bell and discharge apertures 6 are so arranged for the purpose of discharging the torch flame at the most convenient point for igniting the burner.

We claim:

1. In a gas stove provided with a group of burners; the combination of an igniter torch located approximately centrally of the group, the torch comprising a vertically disposed head having a plurality of radially disposed apertures, each aperture being alined with a burner, a vertically disposed bell having a closed top incasing the head, the bell being provided with radially disposed vent holes, each being in register with a head aperture, a pilot nozzle extending into the bell in juxtaposition to the head apertures, and a gas supply means in communication with the head.

2. An igniter torch comprising a vertically disposed head having a plurality of radially disposed apertures, a vertically disposed closed bell having a closed top incasing the head, the bell being provided with a series of radially disposed vent holes, each being in register with a head aperture, a pilot nozzle extending into the bell in juxtaposition to the head apertures, and a gas supply means in communication with said head.

3. In a gas stove provided with a group of burners, the combination of an igniter torch located approximately centrally of the group, comprising a valve-controlled gas supply pipe, a head in communication therewith about which the burners are grouped, the head being provided with an individual gas-discharge aperture alined with each burner and leak apertures below the gas-discharge apertures, a vertically disposed bell incasing the head provided with vent-holes each being in register with a gas-discharge aperture of the head, the mouth of the bell being upon a lower plane than that of the burners to form an air intake, means for securing the top of the bell to the head, means carried by the head for adjusting the flow of gas to its discharge apertures, and a pilot nozzle extending into the bell in juxtaposition to the leak apertures of the head and below the same.

4. In a gas-stove provided with a group of burners; the combination of an igniter torch located approximately centrally of the group, the torch comprising a vertically disposed head having a channel provided with gas discharge apertures adjacent to its upper end, each aperture being alined with a burner, a vertically disposed bell fitted over the head provided with vent-holes in register with the head apertures, the mouth of the bell being upon a lower horizontal plane than that of the burners to form an air intake shield whereby oxygen is supplied

to the torch and burner flames from different stratas of air, a cap-screw in threaded engagement with the head channel, a valve-plug carried by the head for controlling its channel, and a pilot-nozzle extending into the bell its mouth being in juxtaposition to the gas-discharge apertures of said head.

In testimony that we claim the foregoing we have hereunto set our hands at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

JULIUS F. RUTZ.
JULIUS K. LUETHE.

Witnesses:
GEO. W. YOUNG,
MAY DOWNEY.

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AND 377 ARE

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A. O. RÜTZ.

FLASH IGNITER.

APPLICATION FILED APR. 1, 1914.

1,101,146. Patented June 23, 1914

Fig. 1.

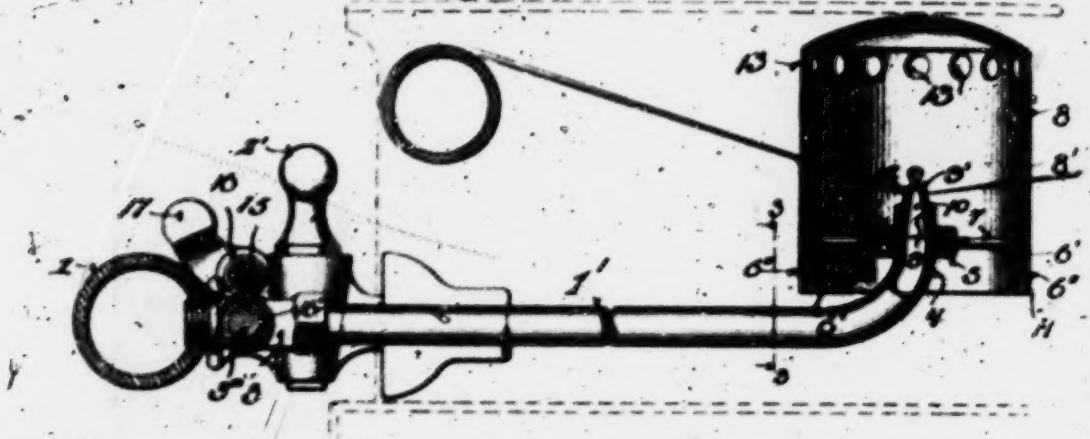


Fig. 3.



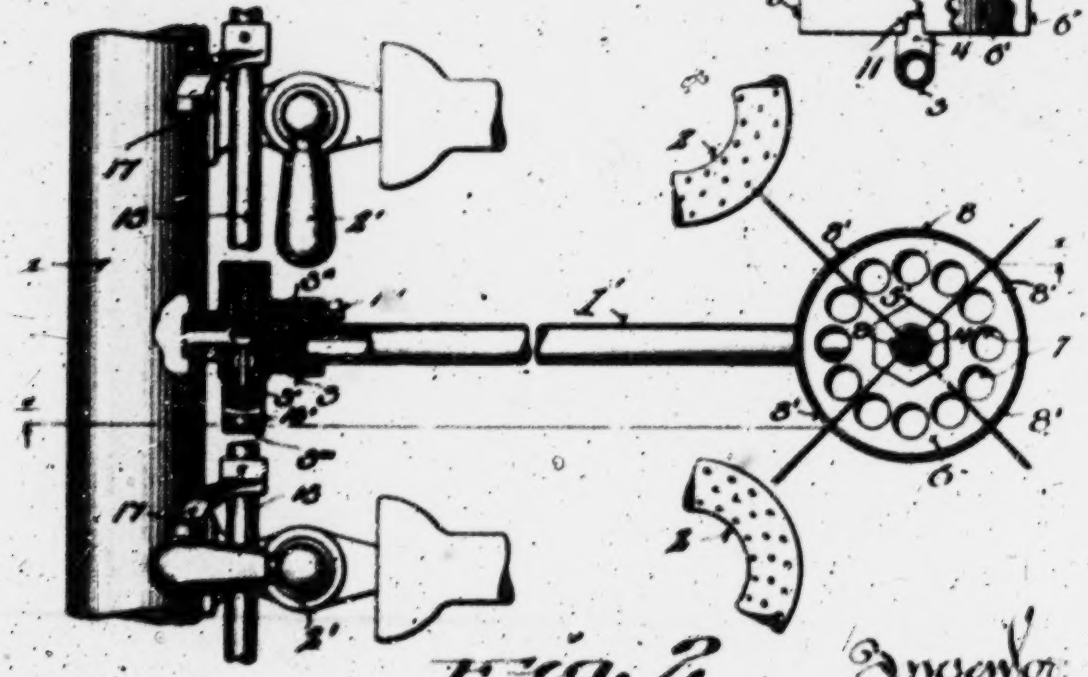


Fig. 2

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Inventor:
Arnold C. Rütz
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Attorneys

UNITED STATES PATENT OFFICE.

ARNOLD O. RUTZ, OF MILWAUKEE, WISCONSIN.

FLASH-IGNITER.

1,101,146. Specification of Letters Patent. Patented June 23, 1914.

Application filed April 1, 1914. Serial No. 828,675.

To all whom it may concern:

Be it known that I, ARNOLD O. RUTZ, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Flash-Igniters; and I do hereby declare that the following is a full, clear, and exact description thereof.

The object of my invention is to provide a simple, economical and effective flash igniter for a series of gas stove burners, the same being grouped about the igniter and within the field of entrained jets of flame, which jets are emitted from the igniter under control of the operator.

Specific objects of my invention are to provide an igniter wherein the constantly burning pilot-light and torch are combined in a single apertured tip, the same having a common gas supply that is increased intermittently to effect a lighting operation through a valve-controlled main lead having a by-pass for supplying the pilot; to provide a pressed steel removable hood for incasing the torch-head that is arranged concentric with said torch-head, whereby overheating at any particular point is obviated and the consequent generation of foul gases avoided; to provide a two-part torch-head having a hood-supporting spider clamped therein, the spider being apertured for the supply of air and also for interlocking engagement with tongues that form part of the hood; to provide a tip for the torch-head having a semi-circular head provided with obliquely and radially disposed gas discharge apertures, the crown of the tip permitting said apertures to be grouped within a small circumference, whereby restricted jets of gas flowing therefrom are caused to commingle in a single pilot-light; to provide firing ports in the hood disposed above the horizontal plane of the pilot-light, whereby said pilot-light is protected against cross-currents of air, and to provide a universal bar in connection with the controlling valve of the torch, which bar carries a series of tappets corresponding to the series of burner valves, whereby when any one of the valves are opened the torch valve is simultaneously actuated to supply the desired quantity of gas for effecting a lighting operation of the burners.

With the above and other objects in view the invention consists in certain peculiarities of construction and combination of parts as hereinafter set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a sectional elevation of a torch embodying the features of my invention, the same being shown in connection with fragments of a gas stove to illustrate its application relative to a burner and the header pipe therefor; Fig. 2, a fragmentary plan view of the same with parts broken away and in section to more clearly illustrate structural features, and Fig. 3, a detailed cross-section, as indicated by line 3—3 in Fig. 1, showing the hood and spider connection.

Referring by characters to the drawings, 1 represents a header pipe for supplying gas to a series of stove burners 2, each of said burners being controlled by a gas cock 2', the said parts constituting no part of my invention. A longitudinally disposed feed pipe 1' is connected to the gas header 1 for supplying gas to the igniter, through the medium of a valve 3 of the spring-controlled push-button type, the same being provided with a free by-pass 3'' thereabout to supply a constant restricted flow of gas to the torch-head for a pilot-light. The outer end of the feed-pipe 1' is bent upwardly in a gentle curve, terminating in an exteriorly threaded nozzle 4. A nut 5 is run down upon the threaded nozzle to form a seating collar for a pressed steel spider 6 of the disk type, which spider has a downturned annular flange 6' and a series of vent apertures 7 cut out of its face about a central aperture through which the nozzle projects. The spider is securely bound to its seat upon the nut 5 by a similar nut 5'. The annular flange 6' of the spider is cut away at four points and the freed metal is bent outwardly to form supporting lugs 6''. The bore of the nozzle 4 is tapered outwardly for the reception of an inwardly tapered tip 9, which tip is removably socketed therein, the same being preferably composed of lava. The tip has a reduced semi-circular head 9' and its

hollow cavity 10 is semi-circularly shaped to correspond to the head forming a thin shell. In order to present an uninterrupted surface throughout the length of the feed pipe and nozzle the cavity of the tip 9 at its mouth is beveled outwardly to a feather edge to present an uninterrupted smooth surface at the point of its union with the walls of the nozzle. Thus any tendency of the flow of gas to break or spread in its travel through the two part torch-head is eliminated, the said torch-head comprising the nozzle and tip respectively.

A cylindrical hood 8 is removably fitted over the downturned spider flange 6', the same being preferably formed from a single thin sheet-metal blank having a crowned or circular dome. The bottom edge of the cylindrical hood is provided with keying recesses 11 for engagement with the spider lugs 6'' and also a series of radially arranged firing ports 8', which ports are disposed at a predetermined distance from the crowned dome. These firing ports are upon a horizontal plane slightly above the head of the torch-tip when the parts are assembled. The semi-circular head 9' of the tip is provided with a series of obliquely and radially disposed gas-supply ducts 12, which ducts correspond in number to the firing ports and are radially alined therewith, but, as previously stated, are upon a lower plane and, owing to the upward inclination, an imaginary line extending in the same direction as the bore, will pass through a companion firing port to thus intersect a related gas-stove burner. The relative arrangement between the firing ports and ducts will thus bring the series of stove burners within the field of the several igniting jets of flame, although the said burners are upon a higher plane. The resulting higher plane of the stove burners, relative to the firing ports of the hood, is due to the fact that the space between the grated top of a standard type of stove and the pan thereunder is limited. Owing to this restriction and the desirability to keep the torch below the face of the stove, it is necessary to reduce the height of the torch mechanism to a compact vertical body. It is also essential to perfect combustion that the torch head tip 9', which burns a constant pilot-flame, should be spaced at a distance equal in all directions from the walls and dome of the hood to prevent generation of foul gases through the heating of said hood. All of these features are provided for and result from the foregoing described arrangement and assemblage, it being borne in mind that the base of the torch-flame is below the line of cross currents of air and is also centrally of the hood with respect to its side walls and circular dome, and, furthermore, owing to the fact that the single restricted pilot flame is supplied by gas through the series of ducts 12, which are grouped closely about the crown of the circular tip, gas traveling from the several ducts, in restricted quantities, will commingle at the top of the tip and feed the constant pilot-flame from several distinct streams, which streams will be difficult to snuff out simultaneously as at least one of the same is at all times protected from inadvertent drafts. Thus in a contracted height a torch is produced having all the necessary qualifications with ample dome space above the torch-head, while at the same time the pilot-light is thoroughly protected and when increased, in a lighting operation, the several flames, although below the vertical plane of the stove burners, will be directed obliquely thereto.

Particular attention is called to the fact that by arranging the torch to discharge oblique flames rather than horizontal flames said flames will have a greater range and traverse the distance between the torch-head and burners to insure their ignition. Should the flame be upon a horizontal plane it is obvious that their tendency to rise as they are discharged, will materially shorten their effective range, this tendency to shorten being also the result of vertical cross-currents of air.

In order to insure more perfect combustion I provide the hood dome with a series of auxiliary vents 13 that encircle said dome above the firing ports and hence air to supply oxygen to the flame will be more readily drawn up through the bottom of the hood and caused to pass in vertical strata above the pilot-light and from thence through the firing ports and vents to effectually check cross currents of air while the small pilot-light is burning.

It will be understood that the flash torch is effectually utilized in connection with manufactured gas, but is particularly efficient in connection with natural gas at high pressure, in either instance the flow of the same being regulated by restricting or increasing the by-pass through a set-screw 14 as shown.

It is apparent from the foregoing description that when it is desired to light any one or all stove burners grouped about the torch, the button-head 3''' of the valve-stem 3' being depressed, will establish direct communication between the header pipe 1 and feed pipe 1' and the full volume of gas under pressure will instantly be discharged through the tip ducts 12, emitting independent flashes of flame through the firing ports that will envelop all burners and ignite that burner which has been previously supplied with gas from the header-pipe by turning its particular cock.

In order to avoid two distinct operations in lighting the burner, I provide a univer-

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sal bar 15 for controlling the pilot-light valve 8. The universal bar 15 extends lengthwise of the bank of stove cocks and is automatically actuated to open the supply of gas to the igniter simultaneously with an opening movement of any one of said stove burner cocks. The universal bar, as shown, is loosely supported or guided upon the shanks of the bank of burner cocks and is capable of a reciprocative movement in one direction opposed by the spring-controlled valve-stem 3' of the feed-pipe. For engaging the feed-pipe valve-stem I provide a metallic clip 16 having a spanner end 16' which is adapted to engage a groove in the push-button head 3'''. The universal bar also carries a series of tappet fingers 17, which tappet fingers are positioned adjacent to corresponding burner cocks and arranged to be engaged by the finger of the operator as the burner valve is opened, such engagement causing the universal rod to move endwise, whereby the torch valve is also opened to permit a full head of gas to be supplied to the pilot-light. Thus the pilot-light and torch-head are combined in a single tip which is controlled by increasing or diminishing the supply of gas thereto.

Owing to the fact that the pilot-light is centrally disposed with relation to the hood and spaced equal distances from its walls, as previously stated, there is slight chance for the accumulation of soot or carbon therein, but, under all conditions, it is desirable to clean the hood from time to time. Hence, owing to the fact that said hood is simply supported on the spider, it can readily be removed for this purpose and when replaced, its firing ports will always be in alinement with the tip ducts due to the fact that the lugs 6'', when inserted within the recesses 11, will cause proper registration.

I am aware that flash torches of various types have been employed heretofore, some of which have utilized a separate pilot-light in connection with leads from the torch-head, which construction, when assembled within a protecting hood or bell, necessarily throws the pilot-light to one side, whereby heat radiating therefrom will cause the hood to rise in temperature unevenly, resulting in the accumulation of sooty deposits and, by combining the pilot and torch in a single tip centrally disposed with relation to the hood, these objectionable features are overcome.

Other forms of igniters have utilized a series of radial vents for feeding a corresponding separate series of pilot flames, which construction materially increases the supply of gas consumed, due to the fact that sufficient gas must at all times be fed to each vent to form a flame having a substantial volume. Each of these pilot lights are also thrown to one side of the hood with the same results as that stated with reference to a single pilot light to one side of a protecting hood or bell.

I claim:

1. A flash-igniter comprising a torch-head having a crown tip provided with radial ducts grouped to form a single pilot-light, a feed-pipe for the torch-head, a valve therefor having a by-pass for supplying a constant flow of gas to said torch-head to form a pilot-light, and a cylindrical dome provided with firing ports in radial alinement with the tip apertures but upon a slightly higher plane than said tip apertures.

2. A flash igniter comprising a torch-head having a semi-circular headed tip provided with a series of radially disposed ducts extending therethrough and grouped to form a continuous pilot-light, a valve-controlled feed-pipe for the torch-head, the valve being provided with a by-pass for supplying a restricted flow of gas to said torch-head, whereby the pilot-light is supplied, a spider secured to the torch-head, and a cylindrical hood detachably fitted to the spider, the hood being provided with firing ports in radial alinement with the tip ducts, but upon a higher plane than the latter.

3. A flash igniter comprising a torch head having a crown tip provided with radially disposed ducts grouped to supply a continuous pilot-light, a feed-pipe for the torch-head, a valve for the feed-pipe having a by-pass for supplying a constant flow of gas to the torch tip, whereby the pilot-light is maintained, and a cylindrical hood removably supported about the torch-head and concentric therewith, the hood being provided with a circular dome, the walls of which together with the side walls of said hood being approximately equal distances from the torch-tip and having a series of firing ports in radial alinement with the tip apertures, the said firing ports being upon a higher horizontal plane than the said tip apertures.

4. A flash igniter comprising a torch-head, a crown tip therefor provided with a series of radially disposed ducts closely grouped to form a constant pilot-light, a feed-pipe for the torch-head, a valve-controlled means for increasing the supply of gas to the feed-pipe, a spider carried by the torch-head, and a circular domed cylindrical hood supported about said torch-head, the hood being provided with firing ports in radial alinement with the tip ducts but upon a higher plane than the latter.

5. A flash igniter comprising a torch-head, a crowned tip therefor provided with obliquely and radially disposed gas ducts

grouped to form a continuous pilot-light, a feed-pipe for supplying a constant flow of gas to the pilot-light, a valve-controlled means for intermittently increasing the supply of gas to the feed-pipe, and a cylindrical dome supported about the torch-head provided with firing ports in alinement with the obliquely disposed tip ducts.

6. A flash igniter comprising a torch-head having a tip provided with a series of radially disposed ducts grouped to form a continuous pilot-light, means for varying the supply of gas to the torch-head, and a circular domed cylindrical hood supported about the torch-head having firing ports alined with the tip apertures upon a higher plane than the latter, the cylindrical wall and circular dome of the hood being positioned approximately equal distances from the torch-head tip.

7. A flash igniter comprising a torch-head, means for supplying a continuous flow of gas thereto, a crown tip for the torch-head having radial ducts grouped closely about the crown portion of said tip to supply streams of gas that commingle to form a single pilot light centrally disposed relative to the tip, and means for increasing the supply of gas to the torch-head ducts whereby the single pilot light is divided into individual projected burner igniter flames, and a hood supported about the torch-head having firing ports in alinement with the tip ducts.

8. A flash igniter comprising a torch-head having a tip provided with radial apertures grouped to form a single pilot-light, means for supplying gas to the torch-head tip in varying quantities, a circular spider secured to the torch-head having a downturned flange provided with lug-extensions, and a cylindrical hood having edge recesses adapted to engage the spider-lugs, the hood being provided with firing ports radially alined with the tip apertures.

9. A flash igniter comprising a torch-head having a tip provided with radial apertures grouped to form a single pilot-light, means for supplying gas to the torch-head tip in varying quantities, a circular spider secured to the torch-head having a down-turned flange provided with lug-extensions, a cylindrical hood having edge recesses adapted to engage the spider-lugs, the hood being provided with firing ports radially alined with the tip apertures, and a series of vent apertures above the firing ports.

10. A torch-head for flash igniters comprising a feed-pipe having an upturned end forming a nozzle, the bore of the nozzle being tapered, and an exteriorly tapered tip fitted into the nozzle having a cavity therein beveled outwardly to a feather edge to form an uninterrupted joint in connection with the nozzle bore, the tip being provided with radially disposed gas-supply ducts that communicate with the cavity.

11. In a gas stove having a header in communication with a series of cock-controlled burners, and a flash igniter therefor having a valve-controlled feed-pipe in communication with the header; the combination of a universal bar in connection with the feed-pipe valve, the bar being extended horizontally of the bank of the burner cocks, and a series of tappets carried by said bar, each being juxtaposed to a burner-controlling cock.

12. A flash-igniter comprising a torch-head having a crown tip provided with radial ducts grouped to form a single pilot-light, a feed-pipe for the torch-head, a valve therefor having a by-pass for supplying a constant flow of gas to said torch-head to form a pilot-light, and a dome provided with firing ports in radial alinement with the tip apertures.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

ARNOLD O. RUTZ.

Witnesses:
Geo. W. Young,
M. E. Downey.

384

E. C. KAHN.

HOOD FOR FLASH IGNITERS.

APPLICATION FILED MAR. 3, 1915.

1,175,627. Patented Mar. 14, 1916.

Fig. 1.

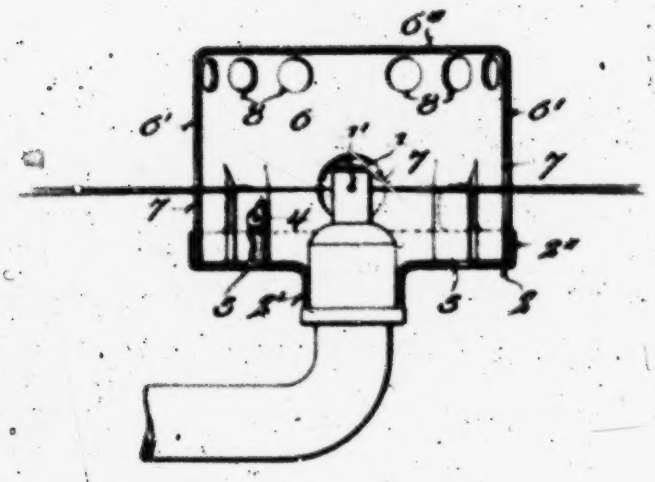


Fig. 2.

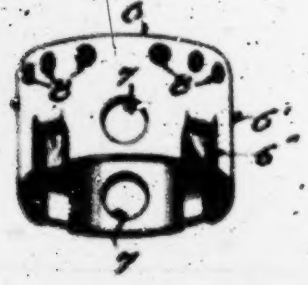


Fig. 3.



Witnesses:

Inventor:

Edward C. Kahn

by

Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD C. KAHN, OF MILWAUKEE, WISCONSIN.

HOOD FOR FLASH-IGNITERS.

1,175,527. Specification of Letters Patent. Patented Mar. 14, 1916.

Application filed March 3, 1915. Serial No. 11,919.

To all whom it may concern:

Be it known that I, EDWARD C. KAHN, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Hoods for Flash-Igniters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention refers to the general type of hooded flash torch utilized for igniting grouped gas stove burners and has for its object to provide a simple, economical and effective hood for such flash torches.

Heretofore, so far as I am aware, the general practice has been to utilize either an open top hood for incasing the gas supply head or a closed dome hood. Practice has demonstrated that where an open top hood has been employed, cross-currents of air frequently snuff out the constantly burning pilot-light and hence the closed dome type of hood is the preferable construction. Objections have been found, however, to a dome wholly closed in the top portion for the reason that the constantly ascending current, composed of the products of combustion, is deflected downwardly by the hood into the path of the incoming fresh air, which feeds the flame, and therefore vitiates it in a manner to interfere seriously with proper combustion and at times to snuff out the pilot light altogether by exclusion of oxygen from the flame. This condition also causes the burning pilot-light to emit obnoxious odors and the partly smothered flame also causes sooty deposits, both upon the burner head and walls of the hood.

My invention is designed to overcome the above referred to objections in a closed hood and it consists essentially in the arrangement of a series of vents disposed above the usual firing ports of such hoods.

Another feature of my invention is to provide a bottom spider for the hood, whereby the same may be conveniently removed for cleansing and the separable construction also renders the device simple in manufacture and convenient in assemblage.

With the above objects in view the invention consists in certain peculiarities of construction and arrangement of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a sectional elevation of a gas-supply head incased within a hood embodying the features of my invention, and Figs. 2 and 3, perspective views of the dismantled hood members.

Referring by characters to the drawings, 1 represents a gas-supply head provided with a series of radially disposed apertures 1′ for the discharge of a corresponding series of jet flames to associated gas stove burners, not shown. The head is supplied with gas under valve control, whereby restricted quantities of the gas are caused to flow from the apertures to form a constant burning pilot-light and when the flow of gas is increased the auxiliary volume will cause a series of jet flames to be emitted from the head, as indicated in Fig. 1 of the drawings. All of the above described mechanism, however, forms no part of my present invention.

The hood elements, which are designed to incase any type of head, comprise a spider 2 in the form of a circular disk having a central aperture therein provided with a downturned flange 2′ for engagement with the head. The rim of the spider is provided with an upturned flange 2″, from the edges of which a series of inwardly offset and upwardly projecting tongues 4 extend. The body of the disk is provided with a series of air inlet apertures 5, whereby oxygen is supplied to the head for proper combustion. Removably seated upon the spider is an inverted cup-like hood 6, the side walls 6′ of which are provided with a series of depressions 6″ extending for a predetermined distance from its mouth adapted to have sliding engagement with the tongues of the spider. The side walls of the hood are also provided with a series of firing ports 7, which are so positioned with relation to the tongue-receiving depressions as to register with the firing apertures of the head.

The side walls of the hood are also provided with a series of vent apertures 8 positioned just below the dome wall 6‴ of the hood, as shown, which vent apertures are so proportioned with relation to the air inlet apertures 5 of the spider as to produce perfect combustion with relation to the constantly burning pilot-light.

From the foregoing description it is apparent that, owing to the hood vents above the firing apertures, there is no liability for the accumulation of a strata of vitiated air or products of combustion above the burner

head to flatten or snuff out the pilot-light. This result is due to the fact that the proper amount of oxygen is admitted from below for combustion and the spent products are carried off through the vent openings 8. Furthermore, it will be seen, owing to the fact that the air intake apertures 5 and vent apertures 8 are uniformly disposed about the pilot-light, the currents of air entering and discharging from the closed hood will flow uniformly about the head, whereby cross-currents are eliminated, which cross-currents would otherwise snuff out or cause the pilot-light to waver and, as previously mentioned, this construction also eliminates the tendency of the low-burning pilot-light to foul the ports in any way, resulting in obnoxious odors.

I claim:

1. A substantially closed dome hood for flash igniters comprising an inverted one-piece cup-like member having a series of firing ports therein, and a series of vent apertures above the firing ports.

2. A substantially closed dome hood for flash igniters comprising an inverted one-piece cup-like member having a series of firing ports therein, a series of vent apertures formed in the wall of the dome above the firing ports, and a spider for supporting the inverted mouth of the cup-like hood.

3. A hood for flash igniters comprising an inverted one-piece cup-like member, the side walls of which are provided with firing ports adjacent to its inverted mouth and vent ports adjacent to its top wall.

4. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece closed dome hood for incasing the head, the hood being provided with firing ports in register with said head, and vent apertures above the firing ports.

5. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece closed top dome hood for incasing the head, the same being provided with firing ports in register with the head apertures and a series of vent apertures above the firing ports, and a spider for supporting the hood having air inlet apertures therein.

6. A one-piece closed top dome hood for flash igniters comprising an inverted cup-like member provided with a series of firing ports and vent ports above the firing ports, and a spider for detachable connection with the inverted mouth of the cup-like hood.

7. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece hood incasing the head and closed at the top, said hood having a series of vent apertures in its side walls adjacent to the top and also having firing ports located below said apertures in registry with the apertures in the head.

8. In a flash torch comprising a burner head having a series of firing apertures therein; the combination of a one-piece hood incasing the head and closed at the top, said hood having a series of vent apertures in its side walls adjacent to the top and also having firing ports located below said apertures in registry with the apertures in the head, and means for supplying air to the hood from the bottom.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

EDWARD C. KAHN.

Witnesses:
GEO. W. YOUNG,
M. E. DOWNEY.

388

Dec. 14, 1926.

W. J. McCLOSKEY

1,610,301

TORCH

Filed May 1, 1925

Fig. 1

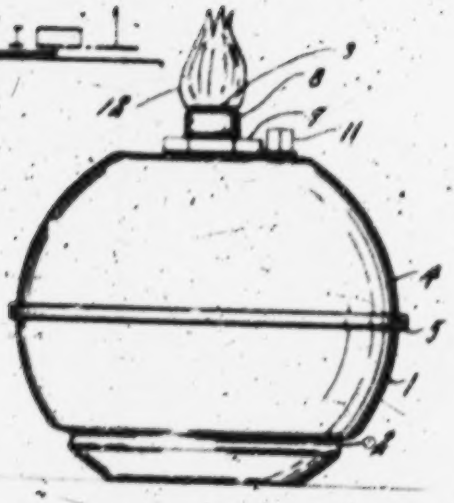


Fig. 2

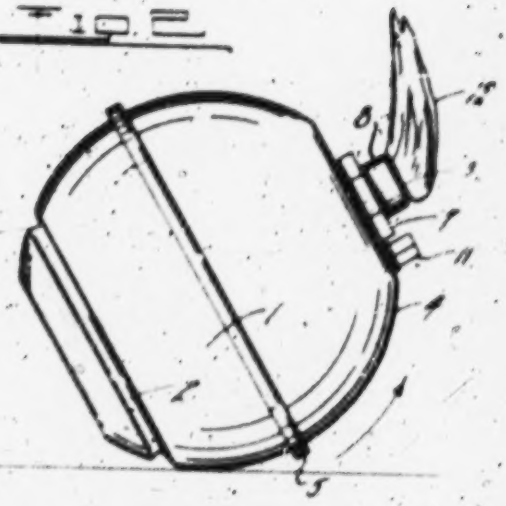
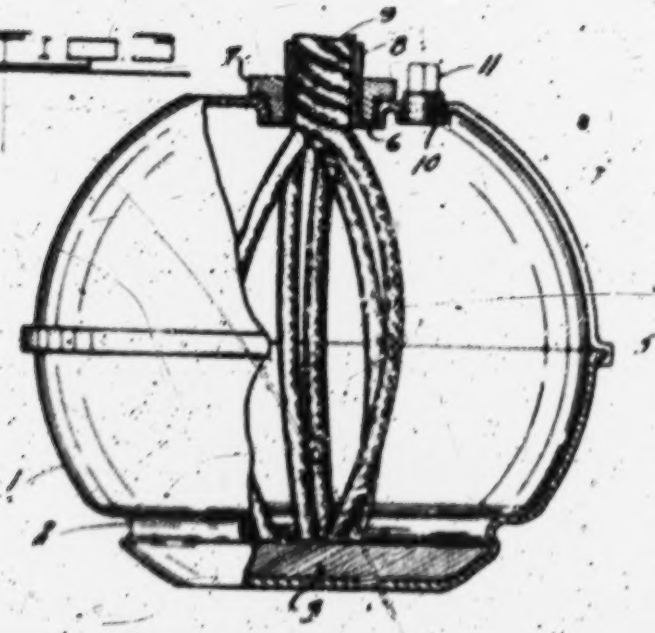


Fig. 3



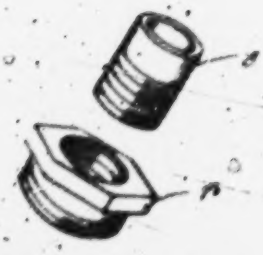


Fig. 4

Fig. 5



Willard J. McCloskey

INVENTOR

BY

ATTORNEY

Patented Dec. 14, 1926. 1,610,301

UNITED STATES PATENT OFFICE.

WILBERT J. McCLOSKEY, OF TOLEDO, OHIO.

TORCH.

Application filed May 1, 1925. Serial No. 27,167.

This invention relates to jostling resistant and self righting torches.

This invention has utility when incorporated in roadway excavation marking torches as subject to disturbance by traffic.

Referring to the drawings:

Fig. 1 is a side elevation of a torch in accordance with the disclosure herein as in normal position;

Fig. 2 is a view of the torch of Fig. 1 as disturbed and about to swing toward self-righting or sit... position of Fig. 1;

Fig. 3 is a view of the torch of Fig. 1, with portions broken away, the scale being enlarged;

Fig. 4 is a distributed view of the wick enveloping nipple and bushing; and

Fig. 5 is a perspective view of the loading element for the torch.

Reservoir member 1 is shown herein as of a base restricting form inwardly extending with annular re-entrant beading 2 as a holder for loading 3 herein shown as a cast plate within this sheet metal lower half of this shell of the spherical reservoir structure of this disclosure. Opposing this semi-circular reservoir element 1 is spherical or dome member 4. These members 1, 4, are herein shown as united by a joint, seam, or weld 5 in the region of the maximum diameter or bulge portion of this reservoir. The dome member 4 has central inwardly threaded throat 6 which is engaged by bushing 7 having nipple 8 therein as a guide for wicking 9. Adjacent this inwardly extending threaded throat 6 is minor throat providing threaded opening 10 in which filling opening plug 11 is disposed. Upon removing the filling opening plug 11, material for combustion, as kerosene, may be introduced into this reservoir or receptacle. The wicking 9 may be worked into and through the nipple 8 to leave the desired extent of the wicking 9 protrude therefrom and then through the larger opening provided by this throat 6 of this sheet metal upper member 4, the loose wicking may be thrust and the bushing 7 assembled into locking position in the opening or throat 6.

This sheet metal unitary structure providing a vessel, is resistant against impact from horses' hoofs or vehicle wheels and when kicked, knocked, or struck will readily shift away from such source and if this be a tendency to disturb the condition of the reservoir as to its base, it normally is matter of but momentary disturbance, for the vessel at once is self-righting so that it will approximate the position or placing in the indicating or guarding of the excavation as in laying or repairing of tracks or pavement with flame 12 of the torch from the upper side of this vessel.

This vessel as made from sheet metal elements 1, 4, is of light weight and tough throughout. The walls are stiff against battering while the loading or weight 3 in the bottom of the vessel is of a mass sufficient to load the vessel for ordinarily rocking the vessel into its upright position for normal operation of the wick 9 for delivering by capillary attraction the kerosene for burning at the flame 12.

What is claimed and it is desired to secure by United States Letters Patent is:—

1. A torch reservoir housing comprising a dome shaped upper section, a complemental zone-shaped base section, and a load within said base section, whereby rocking of the torch is on a spherical bearing of the base section continuous in spherical curvature from the lateral bounding means of the base section as enveloping the load.

2. A torch reservoir housing comprising a dome shaped upper section, a complemental zone-shaped base section having an endless bead, and a rigid load element within the housing for the base section disposed inside said base section to be there retained by said bead, whereby said housing is rockably supported by said base section.

3. A torch complete in itself as to its support, said torch embodying a housing comprising a dome shaped upper portion and a complemental zone shaped base portion, which portions together form a reservoir, said housing upper portion having an opening, a wick receiving bushing in said opening, and a loaded base anchored with the lower portion and disposed within the external radius of said housing, whereby rocking of the torch toward righting position is on a continuous spherical bearing from a tilted supporting side of said housing to a position of rest with its loaded base downward and the wick bushing upward with the housing portion thereabout convex downward.

In witness whereof I affix my signature.

WILBERT J. McCLOSKEY.

Defendant's Exhibit E

Defendant's Exhibit E 1171

IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY,
A CORPORATION,
Plaintiff,
vs.
MONTGOMERY WARD & COMPANY,
A CORPORATION,
Defendant.

In Equity
No. E-8417

1172

Stipulation

It is hereby stipulated by and between the parties hereto by Wilber Owen, Esq., solicitor for plaintiff, and by Carl V. Wisner, Jr., Esq., solicitor for defendant, that Oscar J. Leins, a resident of the City of Milwaukee, State of Wisconsin, would, if called as a witness herein pursuant to a notice of taking testimony heretofore served herein upon January 12, 1938, testify as follows:

That his present occupation is Vice-president and General Manager of the Milwaukee Gas Specialty Company, of Milwaukee, Wisconsin; that he has been connected with that organization since 1920; that prior to his going with that company he attended the University of Wisconsin, from which he graduated with a degree of B. S. from the Department of Mechanical Engineering of that University; 1173

That he was acquainted with Arnold O. Rutz during his lifetime, and that Arnold O. Rutz died in the year 1922; that he is familiar with patent to Arnold O. Rutz, No. 1,101,146; that flash igniters

1174 which contained as a part of their structure the hood 8 disclosed in Fig. 1 of the Rutz patent, No. 1,101,146, or a hood substantially similar to that hood have been manufactured and sold by Milwaukee Gas Specialty Company from approximately the year 1914 down to the present day;

That during that period more than 15,000,000 such flash igniters have been manufactured and sold;

That the witness would further testify that he is familiar with patent No. 1,009,184, issued to Julius F. Rutz and Julius K. Luethe; that flash
1175 igniters which included as a part of their structure the bell 12 shown in Fig. 2 of the drawing of that patent have been manufactured and sold by the Rulu Company of Milwaukee, Wisconsin, during the period from approximately 1910 to approximately 1914; that no such flash igniters are now being manufactured by any company; that the Rulu Company went out of business approximately in 1914;

The witness would further testify that he is familiar with patent to Edward C. Kahn of Milwaukee, Wisconsin, No. 1,175,527; that flash
1176 igniters which included as a part of their structure the cuplike hood shown in Fig. 1 of the drawing of the patent have been manufactured by the Spitfire Company of Milwaukee, Wisconsin; that such flash igniters were manufactured for a short while prior to 1914, but that such manufacture was discontinued sometime in 1914, and that the Spitfire Company is no longer manufacturing such flash igniters;

That the witness would further testify that he is familiar with the scientific principles upon which the design of the hood 8 shown in Fig. 1 of

the patent to Arnold O. Rutz, No. 1,101,146, was based; that in the design of the structure of the hood 8 of patent No. 1,101,146 the inventor had three objects in view: 1177

1. To protect the flame of the igniter from precipitated liquids;
2. To protect the flame of the igniter from lateral currents of air;
3. So to arrange the structure of the device that it would remain alight and be very economical in its consumption of fuel;

That the witness would further testify that from 1920 from time to time down to the present day tests for the resistance of the hood 8 to lateral currents of air and to precipitation of liquid have been made; 1178

It is further stipulated that in connection with such testimony the defendant would offer in evidence the following United States patents as defendant's exhibits:

Arnold O. Rutz, No. 1,101,146 as Defendant's Exhibit 4;

Julius F. Rutz) No. 1,009,184 as Defendant's
Julius K. Luethe) Exhibit 25;

Edward C. Kahn, No. 1,175,527 as Defendant's Exhibit 11. 1179

WILBER OWEN,
Solicitor for Plaintiff.
CARL WISNER, JR.,
Solicitor for Defendant.

Dated at Chicago
this 19th day of
January, 1938.

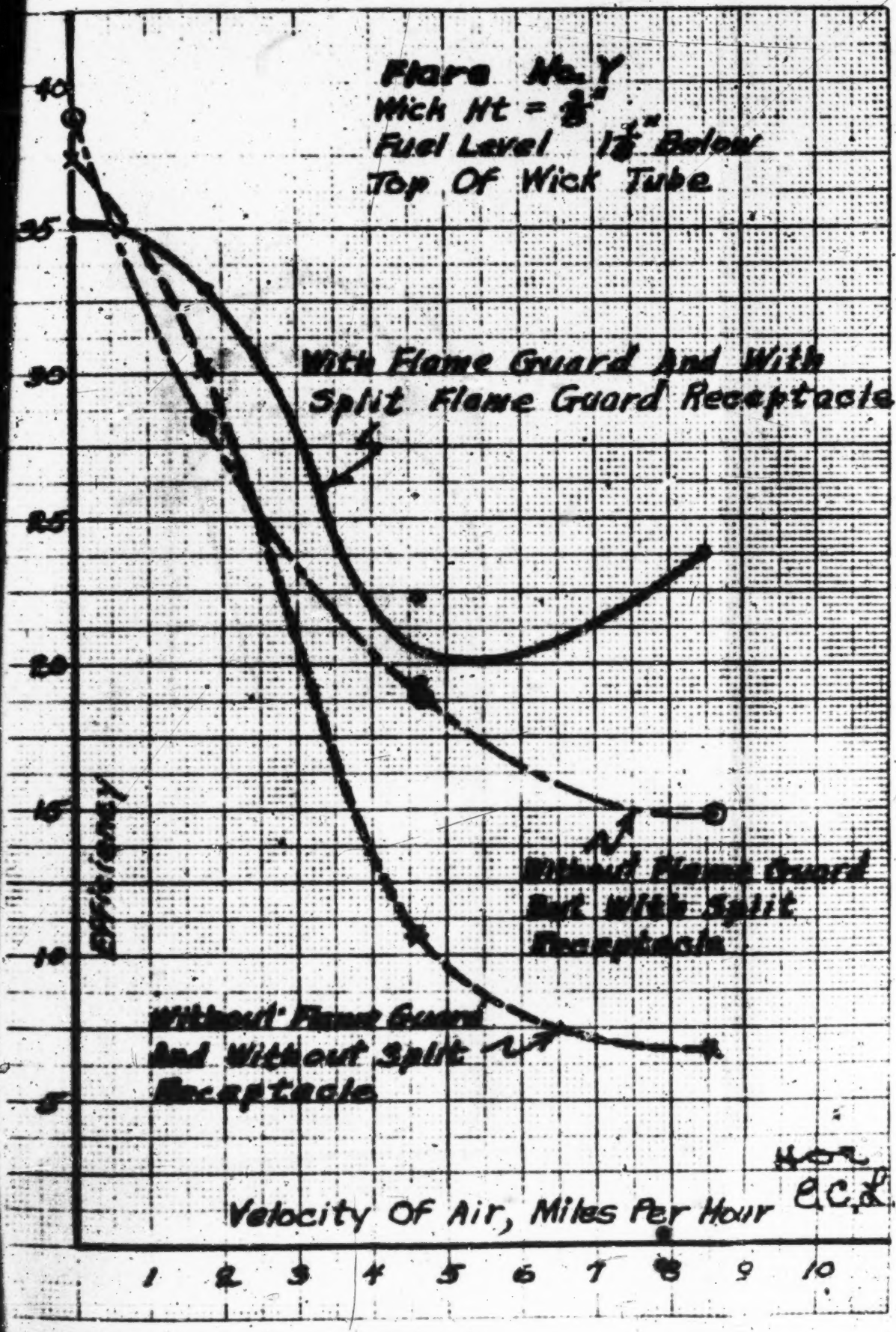

Flare No. Y
Wick Ht = 3/8"
Fuel Level 1 1/8" Below
Top Of Wick Tube
With Flame Guard And With
Split Flame Guard Receptacle
Without Flame Guard
But With Split
Receptacle
Without Flame Guard
And Without Split
Receptacle
Efficiency
40
35
30
25
20
15
10
5
Velocity Of Air, Miles Per Hour
1
2
3
4
5
6
7
8
9
10

Fig. 11

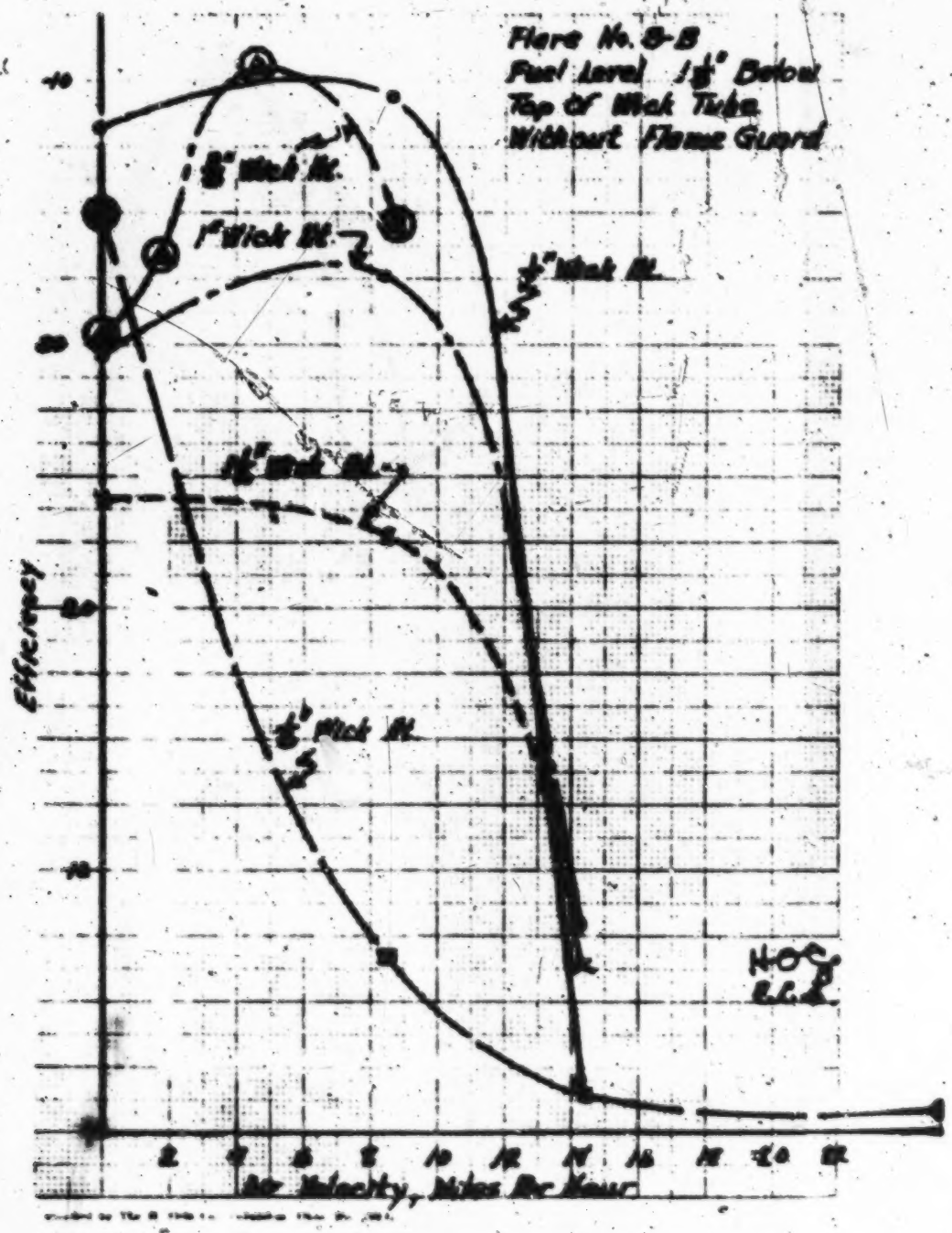

Flare No. S-B
Fuel Level 1/8" Below
Top of Wick Tube
Without Flame Guard
1" Wick Ht.
1/2" Wick Ht.
1/4" Wick Ht.
Efficiency
Air Velocity, Miles Per Hour

Fig. 23 E. 05

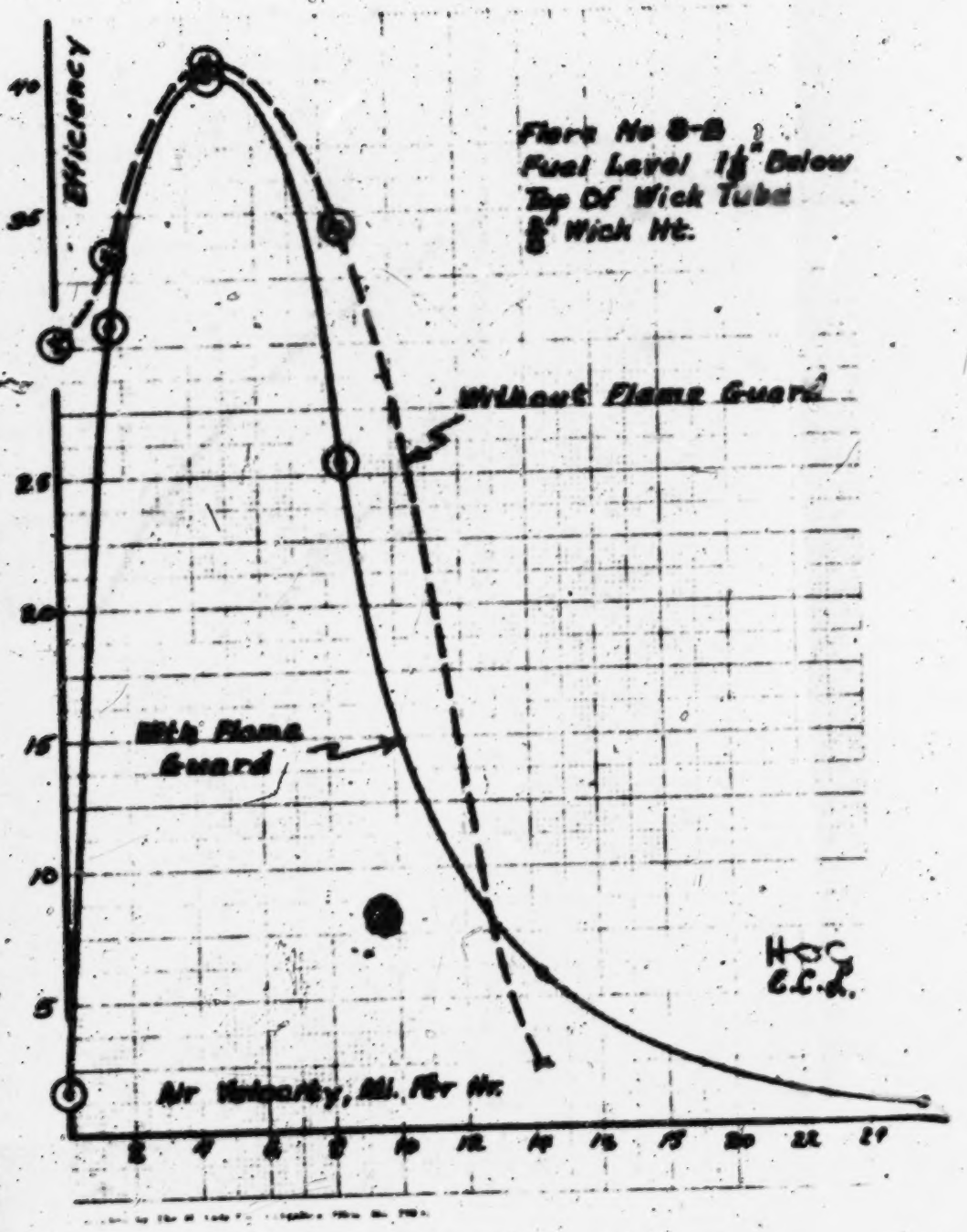

Efficiency
Flame No 8-B
Fuel Level 1⅛" Below
Top Of Wick Tube
⅝" Wick Ht.
Without Flame Guard
With Flame Guard
H₂C
C.C.L.
Air Velocity, Mi. Per Hr.
20
15
10
5
2
4
6
8
10
12
14
16
18
20
22
24

Fig. 75

9903

To L...

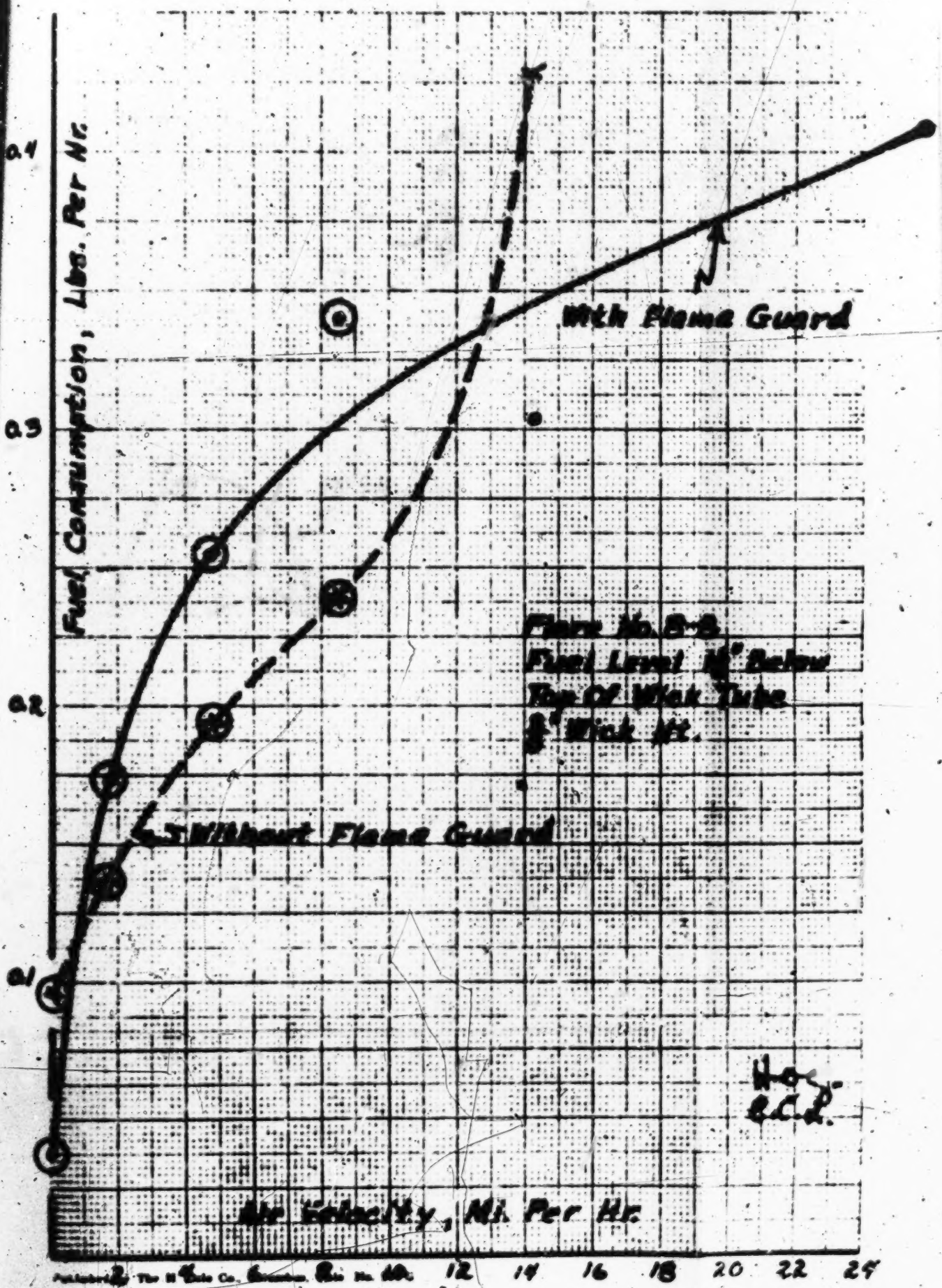

Fuel Consumption, Lbs. Per Hr.
2.4
2.3
2.2
2.1
With Flame Guard
Flame No. 8-8
Fuel Level ⅛" Below
Top Of Wick Tube
⅜" Wick Ht.
Without Flame Guard
Hot
C.C.L.
Air Velocity, Mi. Per Hr.
12
14
16
18
20
22
24

Fig. 36 三六

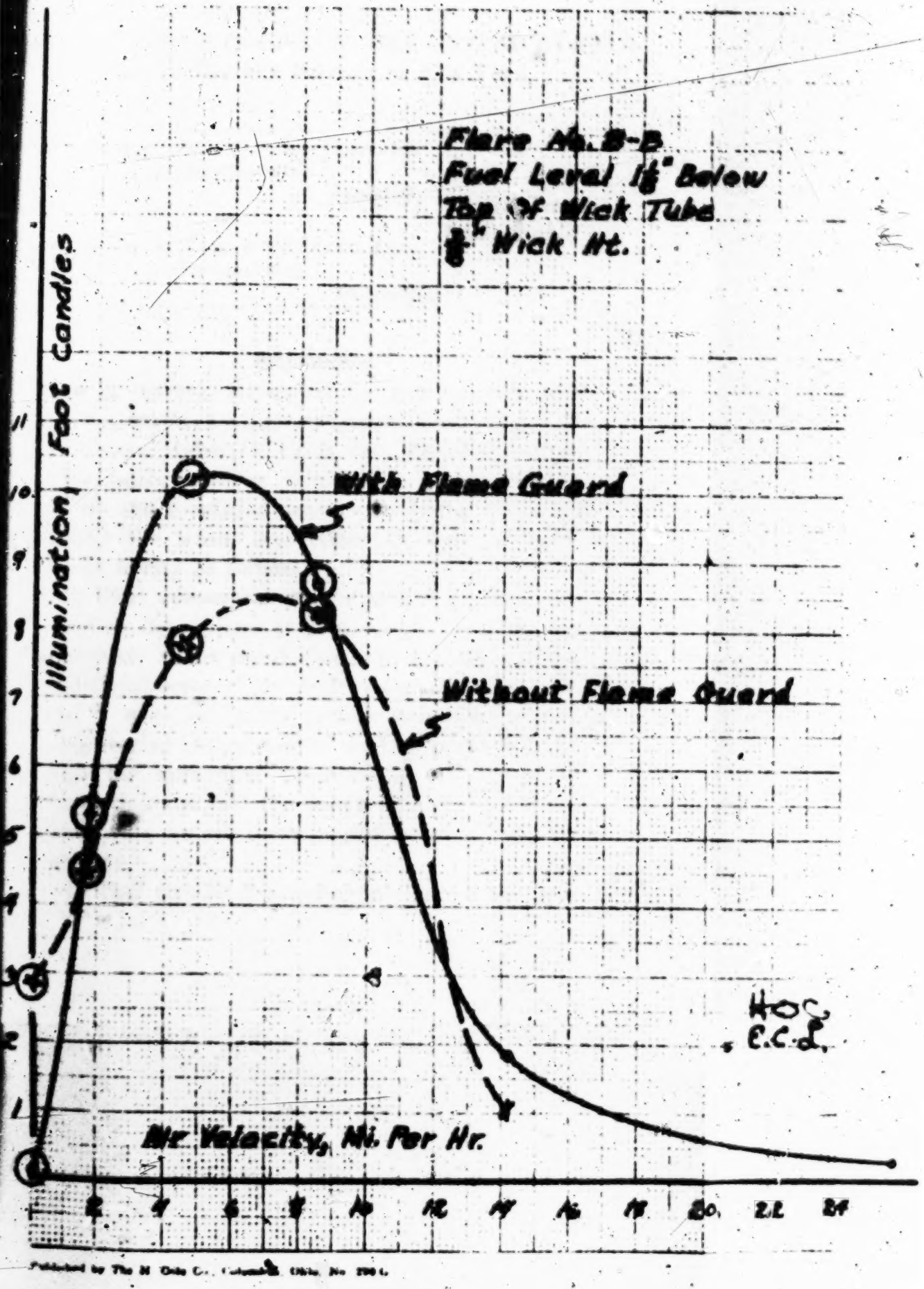

Flame No. 2-B
Fuel Level 1⅛" Below
Top Of Wick Tube
⅜" Wick Ht.
Illumination, Foot Candles
With Flame Guard
Without Flame Guard
Air Velocity, Mi. Per Hr.
HOC
C.C.L.

Fig. 37

Exhibit G

Exhibit G 1213

THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff*, *vs.* MONTGOMERY WARD & COMPANY, INC., A CORPORATION, *Defendant.*	In Equity No. E-8417

1214

Stipulation

It is hereby stipulated by and between the parties hereto, by their respective counsel, that if Professor Huber O. Croft and Elmer C. Lundquist were called as witnesses by the defendant in the above entitled cause, upon being sworn to testify the truth, that either or both of them would testify as follows:

1. That subsequent to the taking of their respective depositions at Iowa City, Iowa, by the defendant on or about January 18, 1938, certain additional tests of the performance of flares 8-B 1215
and Y were run in the testing laboratory of the Engineering Department of the University of Iowa with the apparatus described in the aforesaid deposition and that the results of such additional tests were as set forth in Exhibit A hereto attached;

2. That Exhibit B attached hereto correctly sets forth the results of certain tests which were made by the witnesses Huber O. Croft and Elmer C. Lundquist prior to the taking of their depositions in this cause, and testified to by them in such

405

depositions, and truly represent the data relating to a portion of the tests of plaintiff's and defendant's flares set forth in the notebook identified by said witnesses on said depositions as Defendant's Exhibit 38, and that the graphs offered in evidence in connection with their testimony as Defendant's Exhibits 37 and 39 to 52, both inclusive, were based on the test data set forth in said Exhibit B.

3. That graphs identified as Figures 23 to 28, both inclusive, and 32 to 41, both inclusive, blueprints of which are hereto attached, are true representations in graphic form of the test data disclosed in Exhibits A and B hereto attached; that on the graphs identified as Figures 23 to 28, both inclusive, and 32 to 41, both inclusive, the points which are enclosed in a circle are taken from the original tests disclosed in Exhibit B, and the points which are not circled are taken from data disclosed in Exhibit A;

In stipulating that Messrs. Croft and Lundquist would testify as above stated, if called and sworn as witnesses in this cause, counsel for plaintiff objects to the relevancy and materiality of the foregoing stipulations and of the exhibits and graphs referred to therein. Counsel for plaintiff further reserves the right to make additional objections to this stipulation if and when the same is offered in evidence, not, however, to the qualification of the exhibits or graphs or the absence of the witnesses.

OWEN & OWEN,
Counsel for Plaintiff.
WISNER & WALSH,
Counsel for Defendant.

Dated this ——— day of March, A. D. 1938.

Exhibit G

EXHIBIT A

SUMMARY OF ADDITIONAL TESTS

1219

1 Flare	2 Wick Height	3 Fuel level	4 Wt. fuel burned lb./hr.	5 Avg. air vel. mi./hr.	6 Illumination in ft. candles 12" arm	7 Efficiency	
1. 8-B	½	1⅛	.075	14.3	.13	1.73)	
2. 8-B	½	1⅛	.335	8.9	13.20	39.4)	
3. 8-B	½	1⅛	.113	0.0	4.32	38.2)	
4. 8-B	1	1⅛	.187	14.2	1.48	7.9)	1220
5. 8-B	1	1⅛	.285	8.6	9.20	32.3)	Without flame guard.
6. 8-B	1	1⅛	.216	0.0	6.41	29.7)	With retainer ring.
7. 8-B	1½	1⅛	.255	14.3	1.66	6.5)	
8. 8-B	1½	1⅛	.171	8.5	3.90	22.8)	
9. 8-B	1½	1⅛	.295	0.0	7.11	24.1)	
10. 8-B	⅛	1⅛	.518	25.7	.36	.70	Without flame guard. Without retainer ring.
11. 8-B	⅛	1⅛	.309	25.6	.43	1.39	With flame guard.
12. 8-B	⅛	1⅛	.267	14.2	.40	1.50	Without flame guard. Without retainer ring.
13. 8-B	⅛	1⅛	.349	14.3	2.66	7.6	With flame guard.
14. Y	⅛	1⅛	.043	8.6	.13	3.0	Without flame guard Without split recept. 1221
15. Y	⅛	1⅛	.085	8.5	1.24	14.6	With flame guard.
16. Y	⅛	1⅛	.063	17.1	.60	9.5	With flame guard.
17. 8-B	⅛	1⅛	.158	8.5	1.04	6.6	Without flame guard. Without retainer ring.
18. 8-B	⅛	1⅛	.255	8.6	6.18	24.2	With flame guard.
19. Y	⅛	1⅛	.031	4.5	.60	19.4)	
						)	Bare wick tube.
20. Y	⅛	1⅛	.080	0.0	2.78	34.8)	
21. 8-B	⅛	1⅛	.108	4.94	2.41	22.3	Without flame guard. Without retainer ring.

Exhibit G

1222	22.	8-B	1/8	1 1/8	.136	4.94	3.44	25.3	With flame guard.
	23.	8-B	3/8	1 1/8	.429	14.16	1.02	2.4	Without flame guard
									Without retainer ring
	24.	8-B	3/8	1 1/8	.303	14.18	1.82	6.0	With flame guard.
	25.	8-B	3/8	1 1/8	.408	25.60	.22	0.54	With flame guard.

EXHIBIT B
SUMMARY OF ORIGINAL TESTS

	1	2	3	4	5	6	7	8
	Flare No.	Flame Guard	Wick Ht., In.	Fuel Level In.	Wind Vel. mi./hr.	Kero. Burned lb./hr.	Illum. in Ft Candl. 12" from C	Eff Col. Col.
1223								
	26.	2	Yes	1/8	1 1/8	0.00	.087	2.09*	24.1
	27.	2	No**	1/8	1 1/8	0.00	.061	2.12*	34.8
	28.	2	Yes	1/4	1 1/8	0.00	.094	2.58*	27.5
	29.	2	No**	1/4	1 1/8	0.00	.084	2.75*	32.7
	30.	2	Yes	3/8	1 1/8	0.00	.110	2.90*	26.4
	31.	2	No**	3/8	1 1/8	0.00	.099	2.98*	30.2
	32.	8-B	Yes	1/8	1 1/8	0.00	.037	0.047*	1.2
	33.	8-B	No	1/8	1 1/8	0.00	.057	1.99*	35.0
	34.	8-B	Yes	1/4	1 1/8	0.00	.037	0.053*	1.4
	35.	8-B	No	1/4	1 1/8	0.00	.073	2.20*	30.2
	36.	8-B	Yes	3/8	1 1/8	0.00	.037	0.059*	1.5
1224	37.	8-B	No	3/8	1 1/8	0.00	.094	2.83*	30.2
	38.	8-B	Yes	3/8	2 1/8	0.00	.035	0.053*	1.5
	39.	8-B	No	3/8	2 1/8	0.00	.092	2.55*	27.7
	40.	8-B	Yes	3/8	3 1/8	0.00	.034	.047*	1.3
	41.	8-B	No	3/8	3 1/8	0.00	.083	2.40*	28.9
	42.	8-B	Yes	3/8	1 1/8	8.51	.340	8.64	25.4
	43.	8-B	No	3/8	1 1/8	8.51	.239	8.22	34.4
	44.	8-B	Yes	3/8	1 1/8	4.73	.255	10.22	40.2
	45.	8-B	No	3/8	1 1/8	4.63	.193	7.80	40.5
	46.	8-B	Yes	3/8	1 1/8	1.77	.172	5.31	30.8
	47.	8-B	No	3/8	1 1/8	1.73	.135	4.50	33.4
	48.	Y	Yes##	3/8	1 1/8	0.00	.101	3.56	35.2

Exhibit G

EXHIBIT B (Continued) 1225

1	2	3	4	5	6	7	8
Flare No.	Flame Guard	Wick Ht., In.	Fuel Level In.	Wind Vel. mi./hr.	Kero. Burned lb./hr.	Illum. in Ft-Candl. 12"fromC	Eff. Col. 7 Col. 6
49. Y	No###	3/8	1 1/8	0.00	.094	3.66	38.9
50. Y	No#	3/8	1 1/8	0.00	.122	4.56	37.4
51. Y	Yes##	3/8	1 1/8	8.48	.201	4.78	23.8
52. Y	No#	3/8	1 1/8	8.54	.067	0.45	6.7
53. Y	Yes##	3/8	1 1/8	4.63	.168	3.26	19.4
54. Y	Yes##	3/8	1 1/8	4.60	.166	3.70	22.3
55. Y	No#	3/8	1 1/8	4.60	.068	0.73	10.7
56. Y	Yes##	3/8	1 1/8	1.72	.192	6.35	33.0
57. Y	No#	3/8	1 1/8	1.73	.126	3.80	30.2
58. 2	Yes	3/8	1 1/8	0.00	.113	3.28	29.1
59. 2	No**	3/8	1 1/8	0.00	.120	3.82	31.8

1226

* 7.5 inch arm used but corrected to 12 inches by the "inverse square" law.

** Without flame guard but with regular flame guard receptacle.

\# Without flame guard and without split flame guard receptacle.

With flame guard and with split flame guard receptacle.

1227

Without flame guard but with split flame guard receptacle.

Defendant's Exhibit K

1228

Defendant's Exhibit K
March 9, 1938

COMPARISON OF PERFORMANCE OF PLAINTIFF'S FLARE WITH AND WITHOUT FLAME GUARD

Item No.	Flame Guard	Wick Extension	Air Velocity m.p.h,	Fuel Burned lbs./hr.	Mean Candle Power	Efficiency
1	Yes	3/8"	0.00	0.037	0.059	1.59
2	No	3/8"	0.00	0.094	2.83	30.2
1229 3	Yes	3/8"	1.77	0.172	5.31	30.8
4	No	3/8"	1.73	0.135	4.50	33.4
5	Yes	3/8"	4.73	0.255	10.22	40.2
6	No	3/8"	4.63	0.193	7.80	40.5
7	Yes	3/8"	8.51	0.340	8.64	25.4
8	No.	3/8"	8.51	0.239	8.22	34.4
9	Yes	3/8"	14.18	0.303	1.82	6.0
10	No	3/8"	14.16	0.429	1.02	2.4
11	Yes	1/8"	0.00	0.037	0.047	1.27
12	No	1/8"	0.00	0.057	1.99	35.0
13	Yes	1/8"	4.94	0.136	3.44	25.3
14	No	1/8"	4.94	0.108	2.41	22.3
1230 15	Yes	1/8"	8.60	0.255	6.18	24.2
16	No	1/8"	8.50	0.158	1.04	6.6
17	Yes	1/8"	14.30	0.349	2.66	7.6
18	No	1/8"	14.20	0.267	0.40	1.50
19	Yes	1/8"	25.60	0.309	0.43	1.39
20	No	1/8"	25.70	0.518	0.36	0.70

Averages

21	Average efficiency, 3/8" wick, with flame guard	20.79
22	Average efficiency, 3/8" wick, without flame guard	28.18
23	Average efficiency, 1/8" wick, with flame guard	11.95
24	Average efficiency, 1/8" wick, without flame guard	13.22
25	Average efficiency with flame guard	16.375
26	Average efficiency without flame guard	20.70

Defendant's Exhibit K

COMPARISON OF PERFORMANCE OF PLAINTIFF'S UNPROTECTED FLARE AT VARIOUS WICK HEIGHTS

1231

Item No.	Wick Extension	Air Velocity m.p.m.	Fuel Burned lbs./hr.	Mean Candle Power	Efficiency
1	⅛"	0.00	0.057	1.99	35.0
2	⅛"	8.50	0.158	1.04	6.6
3	⅛"	1420	0.267	0.40	1.5
4	½"	0.00	0.113	4.32	38.2
5	½"	8.90	0.335	13.20	39.4
6	½"	14.30	0.075	0.13	1.73
7	1"	0.00	0.216	6.41	29.7
8	1"	8.60	0.285	9.20	32.3
9	1"	14.20	0.187	1.48	7.90
10	1½"	0.00	0.295	7.11	24.1
11	1½"	8.50	0.171	3.90	22.8
12	1½"	14.30	0.255	1.66	6.50

1232

Averages

13	Average efficiency, ⅛" wick extension	14.33
14	Average efficiency, ½" wick extension	26.44
15	Average efficiency, 1" wick extension	23.30
16	Average efficiency, 1½" wick extension	21.13

1233

Defendant's Exhibit K

1234

COMPARISON OF PERFORMANCE OF PLAINTIFF'S AND DEFENDANT'S FLARES

	Kerosene Burned lb./hr.	Mean Candle-power	Efficiency Candle-power Kero-sene/hr.
No wind: 1/8" wick			
Anthes	0.087	2.09	24.1
Toledo	0.037	0.047	1.27
No wind; 1/4" wick			
Anthes	0.094	2.58	27.5
1235 Toledo	0.037	0.053	1.43
No wind; 3/8" wick			
Anthes	0.110	2.90	26.4
Anthes	0.113	3.28	29.1
Toledo	0.037	0.059	1.59
Wind 1.77 m.p.h.; 3/8" wick			
Anthes	0.192	6.35	33.0
Toledo	0.172	5.31	30.8
Wind 4.65 m.p.h.; 3/8" wick			
Anthes	0.168	3.26	19.4
Anthes	0.166	3.70	22.3
Toledo	0.255	10.22	40.2
1236 Wind 8.5 m.p.h.; 3/8" wick			
Anthes	0.201	4.78	23.8
Toledo	0.34	8.64	25.4

Defendant's Exhibit M 1237
March 10, 1938

STATE OF NEBRASKA, COUNTY OF LANCASTER, *ss.*

I, R. L. Cochran, do hereby certify that I am Governor of the State of Nebraska, and that Mr. R. E. Bollen is the duly appointed Assistant Testing Engineer with the Department of Roads and Irrigation, Motor Vehicle Division, State of Nebraska.

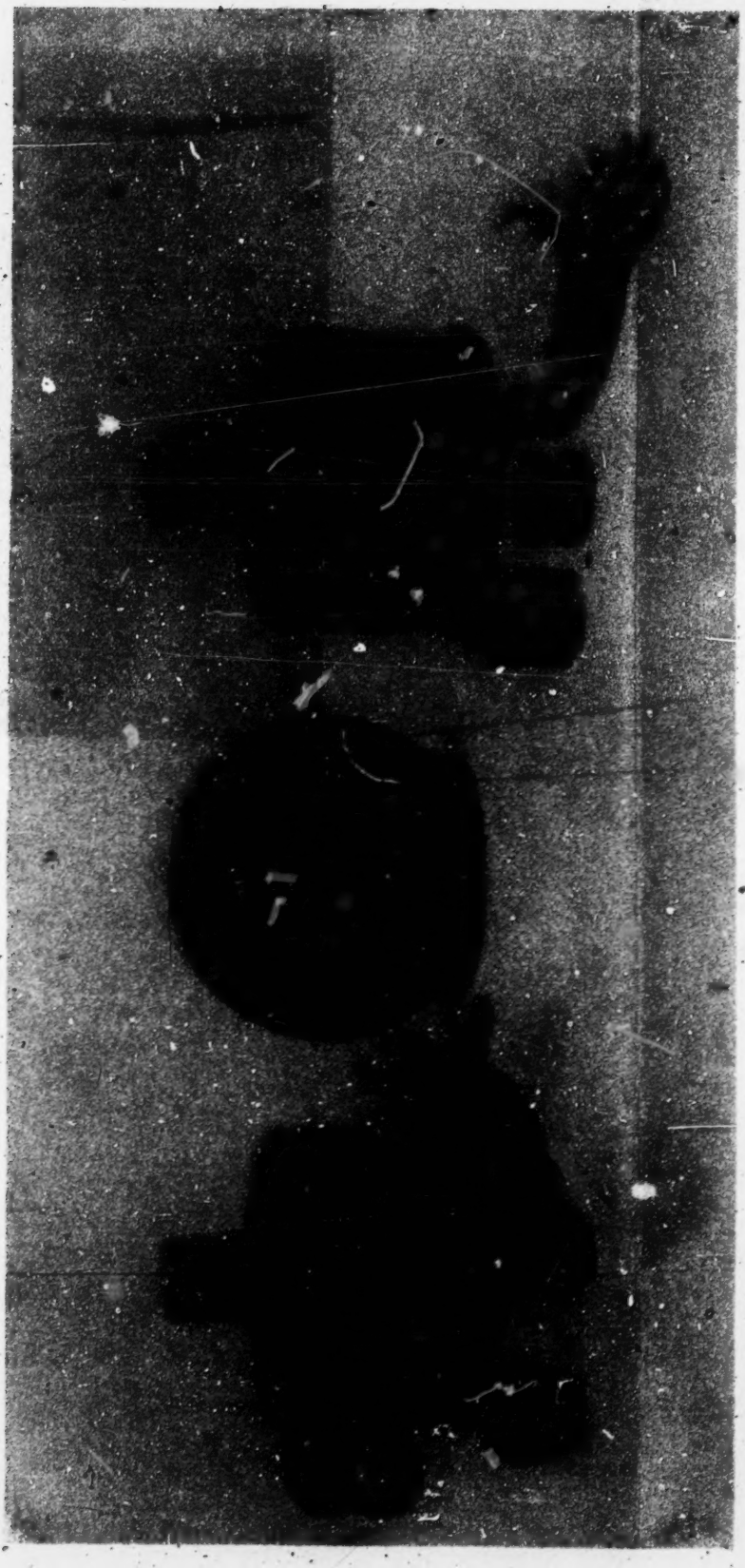
I further certify that Mr. R. R. Horrocks is the duly appointed statistician with the Motor Vehicle Division, Department of Roads and Irrigation, 1238
State of Nebraska, and as such statistician has in his charge and is keeper of records of testing made by the Department, of motor vehicle equipment and of certificates of approval by said Department to any such equipment.

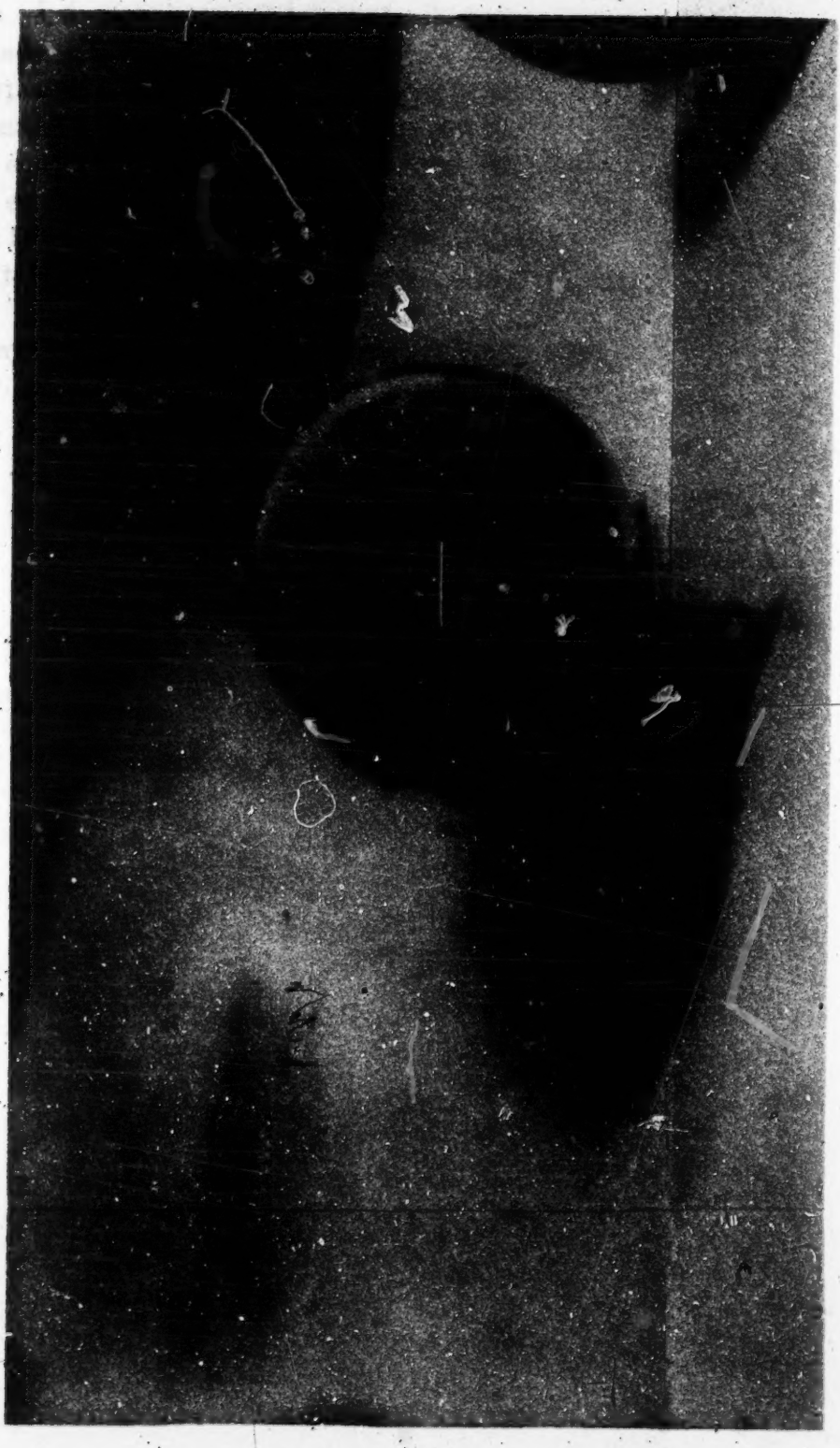
I further certify that Richard C. Hunter is the Attorney General duly elected for the State of Nebraska.

I further certify that the above named R. E. Bollen and R. R. Horrocks are the proper officers to certify to records of testing made by the Department of Roads and Irrigation, and that the at- 1239
tached attestations by them are in due form.

Witness my hand and seal this 31st day of Jan., 1938.

R. L. COCHRAN,
(Seal) Governor.
HARRY R. SWANSON,
Secretary of State,
By DONALD E. DEVRIES,
(Seal) Deputy Secretary of State.





Defendant's Exhibit M

STATE OF NEBRASKA, COUNTY OF LANCASTER, *ss.* 1252

I, Richard C. Hunter, do hereby certify that I am the Attorney General duly elected for the State of Nebraska. I do further certify that the Department of Roads and Irrigation receives in its custody for purposes of conducting experimental tests, road equipment and motor vehicle equipment. When such equipment is received for testing, the samples of equipment tested are retained by the Department for convenience and cannot thereafter be releasd to any person, the manufacturer or otherwise.

Witness my hand and seal this 2nd day of February, 1938. 1253

RICHARD C. HUNTER,
Attorney General.

1254

Defendant's Exhibit M

STATE OF NEBRASKA 1255

No. 21

DEPARTMENT OF ROADS AND IRRIGATION

MOTOR VEHICLE DIVISION

CERTIFICATE APPROVING WARNING DEVICES

THIS CERTIFIES: that the Trukflar—Type PTR manufactured by the Anthes Force Oiler Co., Fort Madison, Iowa, having been duly tested in accordance with Senate File Number 32 of the 1935 Session of the Legislature, approved May 13th, 1935, and with the requirements and specifications 1256 adopted by the State Department of Roads and Irrigation, and found to comply with the provisions of the same, is hereby approved by the State Engineer of the State of Nebraska to be used for motor vehicle equipment within the State, subject to the regulations, as set forth in this act:

Remarks: Identification: (TRUKFLAR) Painted on side of flare. (Anthes Force Oiler Co., Fort Madison, Iowa, Type PTR) Stamped in metal in bottom of flare.

Witness my hand and the Seal of the State Department of Roads and Irrigation at the City of 1257 Lincoln, this 26th day of October, 1937.

A. C. TILLEY, (signed)
State Engineer,

(Seal) By R. W. GULWELL. (signed)

Defendant's Exhibit M

1258

CERTIFICATE OF DEPARTMENT OF ROADS AND IRRIGATION MOTOR VEHICLE DIVISION STATE OF NEBRASKA

STATE OF NEBRASKA, COUNTY OF LANCASTER, *ss.*

I, R. R. Horrocks, do hereby certify that the attached Certificate of Approval of oil burning signal flare is a true and correct copy of Certificate of Approval covering Trukflar—PTR contained in the records of the Department of Roads and Irrigation, Motor Vehicle Division, State of Nebraska,

1259 and that said records including the original certificate together with reports of tests are in my possession and under my care and supervision in the State Capitol Building, Lincoln, Nebraska.

Witness my hand and the seal of the State Department of Roads and Irrigation at the City of Lincoln, Nebraska, this 31st day of Jan., 1938.

R. R. HORROCKS,

(Seal) Statistician, Motor Vehicle Division.

1260

Defendant's Exhibit M

STATE OF NEBRASKA 1261

Department of Roads and Irrigation
Bureau of Roads and Bridges

TESTING LABORATORY

Department of Engineering Mechanics,
University of Nebraska

REPORT OF TEST OF OIL BURNING SIGNAL FLARE

1262

Date Received: September 30, 1937
Date Tested: October 9, 1937

Report No. 47
Lab. Ident. No. 116 a, b, c.
Manufacturer: Anthes Force Oiler Co. Address: Fort Madison, Iowa.
Model or Type: TRUKFLAR—Type PTR
Identification: (TRUKFLAR) Painted on side of flare. (Anthes Force Oiler Co., Fort Madison, Iowa, Type PTR) Stamped in metal in bottom of flare.
Type of Container: Red Colored Metal Box 1263 (6⅛"x6⅛"x18⅛")
Fuel Capacity of Flare: 1350 cc. to fill up to Fuel Level Mark on flare.
Overall Height of Flare: 6"
Size of Wick: ¾"x8" (16 strands of soft material, Red covering, Black marker)
Wick adjustment: 3/16" above wick tube.
Average Burning Time: 10 hours.
Maximum air velocity in which flares will burn: 32 miles per hour.

Defendant's Exhibit M

1264 Sprinkler (Rain) Test: Burns satisfactory in 1¾" per hr. rain, steady rate.
Visibility: Satisfactory at 500 feet.
Leakage (in container): None—very satisfactory.
Construction: Satisfactory.
General Comments: Instructions for wick adjustment, fuel height and method of carrying flare printed on a tag attached to each flare.

Recommended for approval
C. M. DUFF,
Testing Engineer
R. E. BOLLEN, (signed)
1265 Assistant Testing Engineer
10/14/37 fs 8

CERTIFICATE OF DEPARTMENT OF ROADS AND IRRIGATION MOTOR VEHICLE DIVISION STATE OF NEBRASKA

STATE OF NEBRASKA, COUNTY OF LANCASTER, *ss.*

I, R. E. Bollan, do hereby certify that the attached report of test of oil burning signal flare is a true and correct copy of the report of test made
1266 under my supervision and contained in the records of the Department of Roads and Irrigation, Motor Vehicle Division, State of Nebraska, that the attached photographs were taken in our laboratories January 28, 1938, and correctly and truly portray the details of construction and appearance of the truck flares covered by the foregoing test; that the truck flares tested are in the possession of the Department and cannot be released from its custody.

Witness my hand and the seal of the State Department of Roads and Irrigation at the City

Defendant's Exhibit M

of Lincoln, Nebraska, this 31st day of January, 1938.

R. E. BOLLAN,
Assisting Testing Engineer.

STATE OF NEBRASKA, COUNTY OF LANCASTER, ss.

I, R. R. Horrocks, do hereby certify that the attached report of test of oil burning signal flare is a true and correct copy of the report of test contained in the records of the Department of Roads and Irrigation, Motor Vehicle Division, State of Nebraska, and that these records are in my possession and under my care and supervision. I do further certify that the attached photographs were taken in our laboratories January 28, 1938, and correctly and truly portray the details of construction and appearance of the truck flares covered by the foregoing test; that the truck flares tested are in the possession of the Department and cannot be released from its custody.

Witness my hand and the seal of the State Department of Roads and Irrigation at the City of Lincoln, Nebraska, this 31st day of January, 1938.

R. R. HORROCKS,
Statistician, Motor Vehicle Division.

(Seal)

1270 NOTE.—The opinion of the Sixth Circuit Court of Appeals in *Standard Parts, Inc., vs. Toledo Pressed Steel Co.* is reported at page 336 of 93 Fed. (2).

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *vs.* 1271 MONTGOMERY WARD & CO., INC., *Defendant.*	Equity No. 8417

Opinion of Moscowitz, J.
(Filed April 11, 1938)

DARBY & DARBY, Solicitors for Plaintiff. SAMUEL E. DARBY, JR., WILBER OWEN, Of Counsel.

ANTHONY WILLIAM DELLER, Solicitor for Defendant. CARL V. WISNER, JR., Of Counsel.

MOSCOWITZ, D. J.

1272 This is the usual patent suit for the alleged infringement of patent No. 1,732,708 issued to J. E. Withrow and L. W. Close on October 22, 1929. This patent was issued to plaintiff, The Toledo Pressed Steel Company, a corporation, as assignee, and relates to outdoor torches which are used as warning signals on public highways.

The objects of the invention, as stated in the patent, are:

"This invention relates to street torches, such as are commonly used for illuminating road obstructions, and usually referred to as construction torches, but more particularly to devices for

increasing the efficiency of such torches and militating against extinguishment of the torch flame, and an object is to provide a simple and efficient attachment for torches of the above character for increasing the efficiency thereof and materially reducing the liability of extinguishment of the flame by high winds. Another object is to provide a burner so constructed and arranged that liability of extinguishment of the flame by high winds or by rain is reduced to a minimum. Further objects are to provide a device of the above character which may be inexpensively manufactured and has the new and improved features of construction hereinafter described." 1273

Plaintiff claims infringement of claims 2, 5, 11, and 12 of the patent to J. E. Withrow and L. W. Close, No. 1,732,708. Claims 2, 5, 11, and 12 read as follows: 1274

"2. In a device of the class described, a torch body having an opening for a wick, and a flame guard for said wick mounted on the outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports."

"5. In a devise of the class described, a construction torch having an opening in its upper end for a wick, means to hold the wick in place, and a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having an imperforate top wall and side flame and air openings." 1275

"11. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a supporting and heat-receiving flange, and means enclosing a space above said flange and surrounding the wick, except for provision for lateral exit of flame and restricted entrance of air for combustion."

"12. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a lateral flange, and a cap en-

1276 closing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange."

The suit is against Montgomery Ward & Co., Inc., and is defended by Anthes Force Oiler Company, manufacturer of the alleged infringing device.

This patent was held invalid by the Circuit Court of Appeals for the Sixth Circuit in Standard Parts, Inc., vs. Toledo Pressed Steel Co., 93 F. (2d) 336.

1277 The testimony here is substantially the same as the testimony before the court in Standard Parts, Inc., vs. Toledo Pressed Steel Co., supra. No good purpose will be served by a further discussion of the patent in view of the fact that I am in agreement with the conclusions reached in Standard Parts, Inc., vs. Toledo Pressed Steel Co., supra. The Circuit Court in that case decided:

"The bomb-shaped excavation torch, weighted against upsetting, with flattened bottom and a wick receiving opening in its top, was already old when this court in the light of prior art denied validity to McCloskey patent 1,6[illegible]0,301, in 1929.

1278 McCloskey vs. Toledo Pressed Steel Co., 6 Cir., 30 Fd. 2d 12. The appellee had, however, built up a substantial business in the open flame bomb-shaped torches of the McCloskey type before the present patent was granted. Although it claimed for such torches capacity to burn in all kinds of weather, it now says that numerous complaints of their extinguishment by wind and rain led the present patentees to the long series of experiments and tests extending over a number of years which resulted in the burner and guard which is the subject matter of the patent in suit, that the device has successfully met the requirements of contractors and State Highway Commissions, has sold in large volume, has been the

subject of license to several manufacturers, and 1279
has been copied without license by the manufacturer defending the present suits.

"We see no patentable distinction in the many claims in suit, however, they may be differentiated from each other, were the issue solely one of infringement. The elements of claim 1, which relate to the guard or cap, require that it be disposed on the outer side of the torch body to enclose the outer end of the wick, that it have an imperforate upper wall, lateral flame openings, and air openings below the flame openings. Other claims variously describe these cap elements. Claim 2 recites the flame openings as adapted to emit luminescent flame, and designates the cap as a flame guard for the wick. Others speak of 1280
an outwardly extending flange in the region of the wick opening to which the cap is connected, and still others as having the bottom of the cap in heat conducting relation to the flange, or in heat transferring relation to the flange.

"Stripped of variations in nomenclature, and the ingeniously differentiated phrases of counsel in setting forth the claims, the invention is for a burner with a metal guard to protect the flame from air currents and rain. The art is full of illustration and description of metal guards for burners, typical of which are the patents to Almond, No. 193,796; Blake, No. 453,335; Kahn, No. 1,755,527; Heston, No. 270,587, and Hathaway, No. 147,496. The challenge to their pertinence must be repelled. 1281
There is sufficient suggestion in a burner guard when it is found in one familiar contrivance to point the way to its use in another. We have often observed that where an art is a specialized development of an older art the offspring is entitled to the previously disclosed useful characteristics of the ancestral estate. Dunham Co. vs. Cobb, 6 Cir., 19 F. 2d 328; Page Steel & Wire Co. vs. Smith Bros. Hardware Co., 6 Cir., 64 F. 2d 512. A mere change in environment is not patentable unless invention may be found in the concept of the adaptation. Willett Mfg. Co. vs. Root Spring Scraper Co., 6 Cir., 55 F. 2d 858. In Lakewood Engineering Co. vs. Walker, 6 Cir., 23 F. 2d 623,

1282 invention was found in the adaptation of an element from a wholly unrelated art where differences in size, weight, strength, purpose, and manner of use were such that no effective suggestion could have been furnished by the old device. Even there the question was recognized as close, and we have indicated that beyond that we ought not to go. Page Steel & Wire Co. vs. Smith Bros. Hardware Co., supra.

"Once again support for validity is sought in demonstration of commercial success. We have seen that the plaintiff was already a successful manufacturer of open flame flares and torches before the alleged invention was made, extensively advertised as possessing the identical vir-
1283 tues of the device of the patent. Acceptance of licenses where royalty is relatively insignificant does not of itself establish patent validity, Firestone Tire & Rubber Co. vs. United States Rubber Co., 6 Cir., 79 F. 2d 948, since as against strong manufacturers competitors frequently find it more expedient to yield to the claims of a doubtful patent than to undertake the expense and trouble of patent litigation. There is here no substantial evidence of effort general to the industry to solve a problem which long defied it. The proof is limited to experiments of the patentees, and so far as it goes it serves to demonstrate lack of awareness of the teachings of the art rather than the inherent difficulties of the
1284 problem itself. They chose the long road to solution, and the patent law does not reward mere persistence, unassociated with original creative effort.

"Decrees reversed. Causes remanded, with instructions to dismiss the bills for want of invention."

It was old in the art to provide a metal guard to protect the flame from wind and rain. These accomplishments are shown in the patents to Rutz and Malcov. During the many centuries flames have been protected from winds and rains. It was not new to provide a metal covering, in which there were holes, to protect a flame.

I adopt the following findings of fact and conclusions of law submitted by the defendant: 1285

FINDINGS OF FACT

1. This suit involves the questions of validity and infringement of Claims 2, 5, 11, and 12 of patent to Withrow et al. No. 1,732,708, property of the plaintiff.

2. That Claims 2, 5, 11, and 12 of patent to Withrow et al. No. 1,732,708 are void for want of novelty.

3. That torch bodies were well known and in 1286
public use for more than two years prior to December 26, 1928, the filing date of the application for the patent in suit.

4. That metal guards for the protection of flames were well known and in public use for more than two years before December 26, 1928, and that such a guard is shown in patent to Rutz, No. 1,101,146 of June 23, 1914.

5. That devices for maintaining the heat of a wick holder and wick to facilitate the vaporization of the fuel were well known and in public use for more than two years before December 26, 1928, an 1287
example of such a device being shown in Russian patent to Malcov No. 1163 of the year 1868.

6. That Claims 2, 5, 11, and 12 of patent to Withrow et al. No. 1,732,708 are aggregative in view of the McCloskey torch body (Plaintiff's Exhibit 27) and the flame guard manufactured by the Milwaukee Gas Specialty Company and exemplified by the hood 8 of patent to Rutz No. 1,101,146 of June 23, 1914, and shown in Defendant's Exhibit L, and it would only be an act of mechanical skill to apply the Rutz flame guard to a torch body

1288 for the purpose of protecting the wick and flame thereof from wind and rain, or to devise means for maintaining the heat of the wick holder and wick.

7. That defendant is using a flame guard shown in Plaintiff's Exhibits 3, 25 and 26, similar to the flame guard manufactured by the Milwaukee Gas Specialty Company and shown in Defendant's Exhibit L, except as to the size of the flame ports, and the court finds that the difference in size between the flame ports of defendant's structure and of the Rutz flame guard is immaterial.

8. That the flame guard manufactured by the
1289 Milwaukee Gas Specialty Company, and shown in Defendant's Exhibit L, may be employed without change for the purposes of the patent in suit, and that a torch with such a flame guard, similar to Defendant's Exhibit L, has been qualified for use as a highway flare by the Department of Roads and Irrigation, Motor Vehicle Division, State of Nebraska, as shown by Defendant's Exhibit M.

9. Defendant is entitled to a decree.

CONCLUSIONS OF LAW

1290 1. Defendant is entitled to a decree dismissing the bill for want of equity, and finding that the patent in suit is void for want of novelty and invention.

2. Defendant is entitled to its costs.

If the above findings of fact and conclusions of law are not regarded as a sufficient compliance with Rule 70½ of the Equity Rules, other findings of fact and conclusions of law may be submitted on notice.

Decree for defendant. Settle decree on notice.

Grover M. Moscowitz,
U. S. D. J.

UNITED STATES DISTRICT COURT 1291
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *against* MONTGOMERY, WARD & COMPANY, A CORPORATION, *Defendant.*	In Equity No. 8417

Stipulation
(Filed April 26, 1938) 1292

It is hereby stipulated and agreed by and between the solicitors for the respective parties hereto, that the opinion of this court, filed in the above-entitled suit on April 11, 1938, shall stand as the Findings of Fact and Conclusions of Law as required by Equity Rule 70½.

Dated New York, N. Y., April 25, 1938.

DARBY & DARBY,
Solicitors for Plaintiff.

ANTHONY WILLIAM DELLER,
Solicitors for Defendant. 1293

Final Decree

1294 At a term of the United States District Court for the Eastern District of New York held at the Court House thereof in the Post Office Building, Borough of Brooklyn, within said Eastern District, on the 26th day of April, 1938.

Present: HONORABLE GROVER M. MOSCOWITZ, U. S. District Judge.

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff*, *vs.* MONTGOMERY WARD & CO., INC., A CORPORATION, *Defendant*.	In Equity No. E-8417

1295

Final Decree
(Entered April 26, 1938)

This cause came on to be heard in open court on or about March 8, 1938, before His Honor, Judge
1296 Grover M. Moscowitz, and upon consideration of the pleadings, evidence, arguments of counsel and briefs, it is ordered, adjudged and decreed as follows:

1. That Claims 2, 5, 11 and 12 of patent to Withrow et al. No. 1,732,708, property of plaintiff herein, are void for want of novelty.

2. That Claims 2, 5, 11 and 12 of patent to Withrow et al. No. 1,732,708, are for aggregations and not for patentable combinations.

3. That the bill of complaint is hereby dismissed for want of equity. 1297

4. That the defendant shall recover costs from the plaintiff.

ENTER:

Grover M. Moscowitz,
United States District Judge.

Approved as to form:

Darby & Darby,
Solicitors for Plaintiff.

Wilber Owen,
Of Counsel for Plaintiff.

1298

1299

1300 UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *vs.* MONTGOMERY, WARD & CO., INC., A CORPORATION, *Defendant.*	Equity No. 8417

Petition for Appeal

1301 (Filed May 14, 1938)

The above-named plaintiff, feeling itself aggrieved by the final decree made and entered in the above-entitled cause on or about the 26th day of April, 1938, hereby does appeal from said final decree to the United States Circuit Court of Appeals for the Second Circuit, for the reasons set forth in the assignment of errors filed herewith and it prays that its appeal be allowed and that citation be issued as provided by law, directed to the above-named defendant Montgomery, Ward &
1302 Co., Inc., commanding it to appear before the United States Circuit Court of Appeals for the Second Circuit, to do and receive what may pertain to justice to be done in the premises, and that a transcript of the record, proceedings and documents upon which said decree was based, duly authenticated, be sent to the United States Circuit Court of Appeals for the Second Circuit.

DARBY & DARBY,
Solicitors for Plaintiff.

UNITED STATES DISTRICT COURT 1303
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* vs. MONTGOMERY, WARD & CO., INC., A CORPORATION, *Defendant.*	Equity No. 8417

Assignment of Errors
(Filed May 4, 1938) 1304

Now comes the plaintiff in the above-entitled cause and files the following assignment of errors on which it will rely upon its prosecution of the appeal in the above-entitled cause from the decree made by this Honorable Court entered on or about the 26th day of April, 1938.

1. The District Court erred in holding claims 2, 5, 11 and 12 of Withrow and Close patent in suit #1,732,708 invalid for want of novelty.

2. The District Court erred in holding that claims 2, 5, 11 and 12 of said patent #1,732,708 1305
are aggregative in view of the McCloskey torch body (Plaintiff's Exhibit 27) and the flame guard manufactured by The Milwaukee Gas Specialty Company and exemplified by the hood of the patent to Rutz #1,101,146 of June 23, 1914, and shown in Defendant's Exhibit L.

3. The District Court erred in entering a decree dismissing the bill of complaint herein on the ground that claims 2, 5, 11 and 12 of Letters Patent #1,732,708 in suit are invalid.

4. The District Court erred in not holding claims

1306 2, 5, 11 and 12 of said patent valid and infringed by defendant, Montgomery, Ward & Co., Inc.

5. The District Court erred in holding that devices for maintaining the heat of a wick holder and wick to facilitate the vaporization of the fuel were well-known and in public use for more than two years before December 26, 1928, and that an example of such a device is shown in Russian patent to Malcov #1163 of the year 1868.

6. The District Court erred in holding that defendant is using a flame guard similar to the flame guard shown in defendant's Exhibit L except as to
1307 the size of the flame ports, and that the difference in size between the flame ports of defendant's structure and of the flame guard of Exhibit L is immaterial.

7. The District Court erred in holding that it would only be an act of mechanical skill to apply the Rutz flame guard to a torch body for the purpose of protecting the wick and flame thereof from wind and rain, or to devise means for maintaining the heat of the wick holder and wick.

8. The District Court erred in holding that the flame guard manufactured by the Milwaukee Gas
1308 Specialty Company (shown in Defendant's Exhibit L) may be employed without change for the purposes of the patent in suit.

9. The District Court erred in holding that the devices relied upon by the defendant as prior art anticipate the claims of said patent in suit and in not holding that such devices are for non-analogous uses and in non-analogous arts.

10. The District Court erred in holding that the testimony in this cause is substantially the same as the testimony before the Court of Appeals for the Sixth Circuit in Standard Parts, Inc. v. The

Toledo Pressed Steel Company (Reported 93 F. (2d) 336). 1309

11. The District Court erred in following the decision of the Circuit Court of Appeals for the Sixth Circuit in said Standard Parts, Inc. v. The Toledo Pressed Steel Company suit.

12. The District Court erred in not entering a decree for plaintiff for injunction against and for an accounting by said defendant by reason of infringement of claims 2, 5, 11 and 12 of said patent #1,732,708.

Wherefore, and for diverse other errors in the record of this cause appearing, plaintiff prays 1310 that the decree entered herein on the 26th day of April, 1938, be reversed in the above respects, and that the said District Court for the Eastern District of New York be ordered to enter a decree in full accordance herewith.

DARBY & DARBY,
Solicitors for Plaintiff.

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1312 UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *vs.* MONTGOMERY, WARD & CO., INC., A CORPORATION, *Defendant.*	Equity No. 8417

Order Allowing Appeal

1313 (Filed May 4, 1938)

The plaintiff having presented its petition for appeal herein, it is ordered:

1. That the plaintiff's appeal is allowed as prayed for.

2. That the annexed stipulation by and between solicitors of the respective parties waiving the filing of a bond for security for costs on appeal to the Circuit Court of Appeals, is approved.

GROVER M. MOSCOWITZ,
United States District Judge.

1314

Citation

UNITED STATES DISTRICT COURT 1315
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *vs.* MONTGOMERY, WARD & CO., INC., A CORPORATION, *Defendant.*	Equity No. 8417

Citation

(Filed May 4, 1938) 1316

By the HONORABLE GROVER M. MOSCOWITZ, one of the judges of the District Court of the United States for the Eastern District of New York, in the Second Circuit:

To

MONTGOMERY, WARD & COMPANY, INC.

GREETINGS:

You are hereby cited and admonished to be and appear before a United States Circuit Court of Appeals for the Second Circuit, to be holden at the Borough of Manhattan, in the City of New York, 1317
in the District and Circuit above named, on the 4th day of June, 1938, pursuant to an appeal and assignment of errors filed in the Clerk's office of the District Court of the United States for the Eastern District of New York, wherein The Toledo Pressed Steel Company is plaintiff and you are defendant, to show cause, if any there be, why the errors in said appeal and assignment mentioned should not be corrected and speedy justice should not be done in that behalf.

1318 Given under my hand at the Borough of Brooklyn, County of Kings, in the City of New York, in the District and Circuit above named, this 4th day of May, in the year of our Lord One Thousand Nine Hundred and Thirty-eight, and of the Independence of the United States the One Hundred and Sixty-second.

GROVER M. MOSCOWITZ,
Judge of the District Court of the United States
for the Eastern District of New York,
in the Second Circuit.

1319

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IN THE UNITED STATES DISTRICT COURT 1321
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY,
A CORPORATION,
Plaintiff,
vs.
MONTGOMERY, WARD & CO., INC.,
A CORPORATION,
Defendant.

In Equity
No. 8417

Stipulation as to Bond
(Filed May 4, 1938) 1322

It is stipulated and agreed by and between the solicitors for the respective parties that the filing of a bond for security for costs on appeal to the Circuit Court of Appeals in the above-entitled suit is hereby waived.

DARBY & DARBY,
Solicitors for Plaintiff.
A. W. DELLER,
Solicitor for Defendant.

1323

1324 IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *vs.* MONTGOMERY, WARD & CO., INC., A CORPORATION, *Defendant.*	In Equity No. E-8417

Stipulation as to Contents of Record on Appeal

1325

It is hereby stipulated and agreed by and between the solicitors for the respective parties, subject to the approval of the Court, that the transcript of the record for the purposes of appeal shall contain:

1. Bill of Complaint.

2. Answer of Defendant.

3. Record of testimony in narrative form with the exception of the expert testimony of John C. Olsen on behalf of Plaintiff, and of Matthew Luckiesh on behalf of Defendant, which shall be reproduced in question and answer form.

1326

4. Plaintiff's Exhibits:

1, 2, 3, 4, 5, 8, 11 (only the side which contains sectioned view of torch), 12, 15 to 15-I, 16, 18, 24, 25, 27, 28 (first and last pages only), 29, 30, 32, 33 and 34.

5. Defendant's Exhibits:

B,

The following patents from Exhibit C:

Malcov (Russian)	No.	1,163
Salsbury (British		16,524
Von der Weide (Russian)		1,261

Hathaway	147,496	1327
Wall	228,497	
Heston	270,587	
Almond	193,796	
Blake	453,335	
Warren	783,339	
Rutz & Leuthe	1,009,184	
Rutz	1,101,146	
Kahn	1,175,527	
McCloskey	1,610,301	

and E, F, (Figs. 11, 23, 35, 36 and 37 only), G, H, (as narrated pursuant to stipulation), K and M.

6. Opinion of Judge Moscowitz. 1328

6A. Stipulation that Opinion of the Court stands as Finding of Fact and Conclusions of Law as required by Equity Rule 70½.

7. Final Decree.

8. Plaintiff's Petition for Appeal.

9. Plaintiff's Assignment of Errors.

10. Order Allowing Appeal.

11. Citation.

12. Stipulation as to Appeal Bond.

13. This Stipulation as to Transcript on Appeal.

14. Stipulation that Record is a true Transcript.

15. Clerk's Certificate. 1329

It is further stipulated that the narrative form of the depositions of Huber O. Croft and Elmer C. Lundquist filed by the defendant, and that of Philip A. Kerwin filed by plaintiff may be included in the transcript in lieu of the originals of said depositions in question and answer form.

It is further stipulated and agreed that the originals and such of the above exhibits as are reproduced in part in the record and all other exhibits, are to be treated as physical exhibits and certified

1330 by the Clerk to the Circuit Court of Appeals for the Second Circuit.

DARBY & DARBY,
Solicitors for Plaintiff.

A. W. DELLER,
Solicitors for Defendant.

It is so ordered this 19th day of May, 1938,
1331 and the Clerk is directed to certify the record in accordance with the foregoing stipulation without requiring any praecipe or further approval of the evidence by the Court.

GROVER M. MOSCOWITZ,
United States District Judge.

1332

IN THE UNITED STATES DISTRICT COURT 1333
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY,
A CORPORATION,
Plaintiff,
vs.
MONTGOMERY, WARD & Co., INC.,
A CORPORATION,
Defendant.

In Equity
No. 8417

Stipulation

1334

It is hereby stipulated and agreed, that the foregoing is a true copy of the transcript of the record of the District Court in the suit entitled The Toledo Pressed Steel Company vs. Montgomery, Ward & Co., Inc., Equity No. 8417, as agreed on by the parties.

DARBY & DARBY,
Solicitors for Plaintiff.
A. W. DELLER,
Solicitors for Defendant.

1335

On reading the foregoing consent of the solicitors for the respective parties herein, it is ordered that the foregoing printed record be filed in lieu of the original papers for the purpose of certifying the record on appeal.

GROVER M. MOSCOWITZ,
U. S. District Judge.

1336 IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

THE TOLEDO PRESSED STEEL COMPANY, A CORPORATION, *Plaintiff,* *vs.* MONTGOMERY, WARD & CO., INC., A CORPORATION, *Defendant.*	In Equity No. 8417

Clerk's Certificate

1337

I, PERCY G. B. GILKES, Clerk of the District Court of the United States of America for the Eastern District of New York, do hereby certify that the foregoing is a correct copy of the transcript of the printed record ordered filed by the said District Court in the suit entitled The Toledo Pressed Steel Company vs. Montgomery, Ward & Co., Inc., Equity No. 8417, as agreed on by the parties.

In testimony whereof, I have caused the seal of the said Court to be hereunto affixed at the City
1338 of New York, in the Eastern District of New York, this 2nd day of June, in the year of our Lord one thousand nine hundred and thirty-eight and of the Independence of the said United States the one hundred and sixty-second.

PERCY G. B. GILKES,
Clerk.

[fol. 447] UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT, OCTOBER TERM, 1938

Argued Oct. 14, 1938. Decided Nov. 7, 1938

No. 54

THE TOLEDO PRESSED STEEL COMPANY, Plaintiff-Appellant,

v.

MONTGOMERY, WARD & COMPANY, Defendant-Appellee

Appeal from the District Court of the United States for the Eastern District of New York

Before Manton, Swan, and Chase, Circuit Judges

Appeal from the District Court for the Eastern District of New York. Suit by Toledo Pressed Steel Co., plaintiff, against Montgomery, Ward & Company, defendant, for infringement of patent for a burner. Decree for defendant; plaintiff appeals. Reversed.

Darby & Darby, of New York City (Samuel E. Darby, Jr., of New York City, and Wilber Owen, of Toledo, Ohio, of counsel) for plaintiff.

Anthony William Deller, of New York City (Carl V. Wisner, Jr., of Chicago, Ill., of counsel), for appellee.

MANTON, Circuit Judge:

This suit is for infringement of patent No. 1,732,708 granted October 22, 1929, on an application filed December 26, 1928 for a kerosene burning construction torch. Claims 2, 5, 11 and 12 [1] are sued on.

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[1] 2. In a device of the class described, a torch body having an opening for a wick, and a flame guard for said wick mounted on the outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports.

5. In a device of the class described, a construction torch having an opening in its upper end for a wick, means to hold

This torch is used as a warning signal on streets to make known obstructions on the highway. The patent states: "This invention relates to street torches, such as are commonly used for illuminating road obstructions, and usually referred to as construction torches, but more particularly to devices for increasing the efficiency of such torches and militating against extinguishment of the torch flame, and an object is to provide a simple and efficient attachment for torches of the above character for increasing the efficiency thereof and materially reducing the liability of extinguishment of the flame by high winds. Another object is to provide a burner so constructed and arranged that liability of [fol. 448] extinguishment of the flame by high winds or by rain is reduced to a minimum. * * *"

And further: "* * * It has been found that with the above described construction and arrangement, the oil consumption is materially decreased. It is also found that the amount of wick used is likewise decreased. Another outstanding advantage resides in reducing the liability of extinguishing the flame by high winds or rain."

Oil consumption by the burner of the patent in suit is reduced more than 50% as compared with its predecessor, the open flame torch; wick consumption which was from three-fourths of an inch to an inch and a quarter each night in the open flame torch was practically eliminated. It is

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the wick in place, and a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having an imperforate top wall and side flame and air openings.

11. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a supporting and heat-receiving flange, and means enclosing a space above said flange and surrounding the wick, except for provision for lateral exit of flame and restricted entrance of air for combustion.

12. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and lateral flange, and a cap enclosing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange.

undisputed that appellant and appellee's torches now pass all the tests imposed by the State Highway Departments, none of which are passed by the open flame torch. These advantages are obtained by substituting for the burner of the old open flame torch, which was a wick-tube and wick protruding from the container for oil, a burner in which the end of the wick-tube and wick are enclosed in a metal cap provided with suitable air inlets and flame outlets. The cap is supported on a flange which contacts the wick-tube and transmits heat to the wick-tube and wick to maintain the oil above the flash point and provide under all weather conditions a suitable supply of hydrocarbon vapor which escapes from the flame openings in the metal cap and burns outside the cap. Regardless of the effect of wind and rain on the flame outside the burner, the source of the flame inside the burner is protected and continues to supply the hydrocarbon vapor necessary to feed the flame which is the warning signal.

This patent was litigated in the Sixth Circuit where the Circuit Court of Appeals held it to be invalid. Standard Parts, Inc., v. Toledo Pressed Steel Co., 93 F. 2d 336. The court below felt obliged to follow that decision.

This record, however, contains evidence absent in the Standard Parts Case, showing that the art was in search for this accomplishment; that others worked unsuccessfully to solve the problem of producing a torch which would not only be more economical in the use of kerosene, but would remain lighted notwithstanding rain and wind. In the Standard Parts Case, it was said that the problem required no inventive thought. The proof here, not found in the Standard Parts Case, showed widely separate unsuccessful attempts to provide some means which would prevent the flame from being extinguished. Unsuccessful efforts were made over a long period by men skilled in the art of burners. The history of the art, as here shown, demonstrates that the accomplishment was not easy nor apparent nor merely the work of one skilled in the art. Hookless Fastener Co. v. G. E. Prentice Mfg. Co., 2 Cir., 68 F. 2d. 940, 941.

The open flame torch had been in use as a warning signal for many years. The usual type was a sheet metal container with a wick one and a half inches long; the wick was soaked with kerosene and burned from the sides as well as the top. It was referred to as a "bonfire of cotton fibre".

High fuel and wick consumption were the consequence. A strong wind would blow the flame away from the wick and cool the oil below the flash point, thus causing the flame to go out. If water soaked the wick, it would vaporize and cool the wick below the temperature at which the oil would burn and the flame would go out. Moreover, the flame produced was three or four inches in diameter and sometimes six to eight inches high of irregular shape, flickering and weaving from side to side with changing air currents.

The problem presented was to preserve this open unsteady flame and maintain it under all kinds of weather conditions without enclosing it. By the mechanical combination of parts shown in the patent, the results above referred to as to efficiency and economy were obtained. Kerosene gives off no combustible vapors at ordinary temperature, but must be heated to the flash point which runs up to 150° or 160° F. There is a small protected combustion chamber in the bottom of the cap in both appellant's and appellee's devices, provided with restricted air inlets, so that, when lighted, it has a little chamber where a little air is admitted, and which maintains the temperature of the wick to the point where it will give off vapor. The cap temperature was found on test to run as high as 780° F; the heat from the cap was conducted into the flange and into the tube surrounding the wick, and this heat would supplement the heat [fol. 449] from the small flame in the combustion zone and would succeed in maintaining the temperature of the wick tube and the kerosene which would be vaporized and keep the flame going. On tests it was found that high wind velocity did not seem to succeed in eliminating the flame or cooling the kerosene as used in both appellant's and appellee's burners. Both acted alike in that respect and both gave high temperature of feed.

That the problem required more than mechanical skill is demonstrated by the efforts and trials of those interested in its solution. The need for the general use of torches became more necessary with the general use of automobiles. The evidence shows that it has been the experience of those using the open flame torch that it blew out or was rained out and there was a real problem of securing a burner which would stand both rain and wind. Unsuccessful attempts have been made by competitors who had been long in the business of manufacturing and selling open flame torches.

The results of these experiments were placed upon the market and, until the burner under the patent in suit appeared, they had not solved the problem. When placed on the market, appellant's burner superseded open flame torches. Other manufacturers of sheet metal open flame torches soon abandoned their makes in favor of the patented type. Some competitors took out licenses under the patent; others brought out torches similar to the patented device and in so doing passed the tests prescribed by State Highway Departments for signal devices. It was only after a series of experiments extending over a long period that the inventor here succeeded. It was the protection of the source of the flame from wind and rain by means of the metal guard provided with suitable openings, thus insuring the maintenance of a small portion of the flame in a protected zone and utilizing the heat from this flame and the heat from the metal guard to maintain the temperature of the kerosene in the wick above the flash point which insured a supply of gaseous vapor at all times which would pass outside the guard and thereby provide the open and unprotected flame which formed the warning signal.

The prior art does not disclose or suggest the combination or result here obtained. The patent to Rutz No. 1,101,146, granted June 23, 1914, had for its object "to provide a simple, economical and effective flash igniter for a series of gas stove burners, the same being grouped about the igniter and within the field of entrained jets of flame, which jets are emitted from the igniter under the control of the operator."

This device was used on a kitchen gas range and many of them were sold. The flame they are designed to protect is a small pilot light, which burns continuously and is so feeble that it might be extinguished by indoor drafts, such as the sudden closing of a door. The flame is completely enclosed within the metal cap. The principal function of this cap is materially different from any function of a burner of the patent in suit. The fuel is not the same. Rutz uses gas under pressure. The patentee here uses kerosene which must be vaporized before it will burn and when vaporized is not under pressure. There is the problem of heating the fuel to vaporize it. Rutz makes provision for cooling the cap by providing a substantial space between the pilot light and the cap walls, also by passing

a cylinder of air up through the vent openings in the supporting disk and out through vent openings near the top of the cap, whereas in the patent in suit the heat of the cap is utilized to assist in heating the kerosene in the wick above the flash point. In the Rutz patent there is no means for heating the cap if its use there were desirable. The pilot light is small and so far spaced from the cap that no substantial amount of heat will be transmitted to the cap, even in the absence of the rising cylinder of air inside the cap and along its walls. The flame which follows the jets of gas to the stove burners continues for only a fraction of a second and does not impinge upon the walls of the cap.

Heating the cap is very important in the patent in suit, one of its functions being to supply heat to the wick and the oil in the wick tube so as to raise the oil above the flash point. In the Rutz patent there was no problem of fuel or wick consumption, where as these were important considerations of the patent in suit. Rutz had no problem of maintaining the flame under conditions of wind and rain.

The Russian patent to Malcov, No. 1163 of 1868, is for a lamp burner of special construction. The description is meager and the drawing vague and it is justly so criticized. [fol. 450] The specifications refer to two tubes and state that between them "there remains a space into which may enter a third tube called regulator and intended for the adjusting of the size of the flame". Apparently it was intended to use charcoal which would become heated above the flash point of the oil and hydrocarbon vapors and would escape through the small perforations in the dome, where they would mix with the air and burn. The experts called were unable to understand the disclosure of this Russian patent. It does not anticipate the patent in suit.

In Rockwood v. General Fire Extinguisher Co., 2 Cir., 8 F. 2d 682, 686, we pointed out that if changes had to be made in the combination cited as in anticipation to make it a successful commercial device, it would not be such prior art as would invalidate a patent. But it is argued that appellant had sought a patent by attempting to obtain a monopoly on a new use for the Rutz structure. It is said that the appellant has attempted to take one element, the guard for the pilot light from the Rutz apparatus, and combine it with a fuel tank wick and wick holder of the prior art in such a manner as to accomplish to some degree, the functions and results of the patent in suit. But the device

here used as a warning signal—the burner—must be considered as an entirety, that is, the oil container, the wick, the wick tube and the top. Dwight & Lloyd Sintering Co. v. Greenawalt, 2 Cir., 27 F. 2d 823; Traitel Marble Co. v. U. T. Hungerford Brass & Copper Co., 2 Cir., 18 F. 2d 66, 68. While torch bodies and flame guards were old, they have never been used together to perform the function or produce the results of the device of the patent in suit. If they were ever combined for any purpose, it was not to protect the flame at its source so as to provide a small protected chamber in which some part of the flame would continue to burn regardless of outside weather conditions, with the greater and visible part of the flame burning as a warning signal outside the guard. This combination and use amounted to invention. Instead of being for a combination of elements whose novelty depends upon an improvement of one of the elements without change of function or result of combination in its entirety, this patent covers a unitary structure patented as an entirety. Westinghouse Electric & Mfg. Co. v. Wagner Electric & Mfg. Co., 225 U. S. 604, 32 S. Ct. 691, 56 L. Ed. 1222, 41 L. R. A., N. S., 653; Elizabeth v. Pavement Co., 97 U. S. 126, 24 L. Ed. 1000; Stromberg Motor Devices Co. v. Zenith-Detroit Corp., 2 Cir., 73 F. 2d 62.

But defendant says it avoids infringement because in its device the flange which supports the cap is elevated a short distance above the body of the torch and the air inlet openings are located in this supporting flange instead of in the side of the cap. No statement in the claims of specifications requires that the cap rest directly on the body of the torch, nor that the air inlet ports be located in the body of the cap. The patentees state that while they have shown and described the constructions "which admirably fulfill the objects primarily enumerated, it is to be understood that the above description * * * is given by way of illustration and not of limitation.

Claim 2 calls for a "flame guard for said wick mounted on the outside of said torch body, said guard including * * * air ports." In appellee's device the flame guard is mounted on the outside of the torch body. There is no doubt that the flame guard includes both the cap and its supporting flange and that the flame guard includes air ports.

Claim 5 calls for "a guard fitting over the outer end of the wick * * *, said guard having an imperforate top

wall and side flame with air openings". Considering the guard as including both cap and supporting flange, appellee's flare has air openings in the guard at the side of the wick,—an important consideration,—rather than locating them in the side of the cap.

The non-infringement of claim 11 is based on the claim that appellee has separated the wick-tube-supporting and heat-receiving portions of the flange of the patent. But this overlooks the rule that infringement cannot be avoided by substituting two parts for a single part of a patented structure when the two parts perform the same function as does the single part of the patent. Arthur Colton Co. v. McKesson & Robbins Inc., 2 Cir., 58 F. 2d 157, 158; Line Material Co. v. Brady Electric Mfg. Co., 2 Cir., 7 F. 2d 48, 50.

As to claim 12, it is contended that the word "lateral" applies to the location of the air openings and requires that [fol. 451] they be in the cap. The air inlets in the supporting flange of the appellee's flare are located laterally with respect to the wick and wick tube, as are the air inlets of appellant's device.

These arguments, as to non-infringement, fail to give effect to the established rules that infringement exists if the substance of the invention which is defined by the claims, as distinguished from its form, is appropriated, and that infringement of a combination claim is not avoided by reason of the fact that the appellee is free to use some or all of the separate elements of the combination because they existed in the prior art. Smith v. Snow, 294 U. S. 1, 55 S. Ct. 279, 79 L. Ed. 721; Winans v. Denmead, 15 How. 330, 56 U. S. 330, 14 L. Ed. 717; Sanitary Refrigerator Co. v. Winters, 280 U. S. 30, 50 S. Ct. 9, 74 L. Ed. 147; Hillard v. Fisher Book Typewriter Co., 2 Cir., 159 F. 439, 442.

On this record we hold that invention has been established and that the appellee's device infringes the claims here sued on.

Decree reversed.

Chase, Circuit Judge, dissenting without opinion.

IN THE

United States Circuit Court of Appeals

FOR THE SECOND CIRCUIT

No. 54.

THE TOLEDO PRESSED STEEL COMPANY,
Plaintiff-Appellant,

vs.

MONTGOMERY WARD & COMPANY, INC.,
Defendant-Appellee.

PETITION FOR REHEARING

MAY IT PLEASE THE COURT:

Now comes Montgomery Ward & Company, Inc., defendant-appellee, and files this, its petition for rehearing, and respectfully prays that it may have a rehearing of the above-entitled cause.

It is respectfully urged that the opinion of the Court, in holding *valid* the patent in suit previously held *invalid* by the Circuit Court of Appeals for the Sixth Circuit (*Standard Parts, Inc.* v. *Toledo Pressed Steel Company*, 93 F (2nd) 338), has misapprehended the record and has departed from long-established principles of the patent

law. In view of the propriety in the instant case of *certiorari* to the Supreme Court to resolve the conflict between the Second and Sixth Circuits as to the validity of the patent in suit, it would seem proper to point out the record facts which, in our judgment, require an affirmance of the District Court's decree.

Statement.

In order to reach the conclusion that reversal was necessary in the instant case, the Court has to adopt in their entirety certain propositions which, for convenience, may be tabulated as follows:

(*a*) "Unsuccessful efforts (to solve the problem) were made over a long period by men skilled in the art of burners"; this was supposed to be new evidence which differentiated the instant case from the Standard Parts case in the Sixth Circuit.

(*b*) It was assumed that the combination of a torch body, a wick and a flame guard was novel, although the record shows the precise combination in Wall, No. 228,497 of the year 1880. A supplementary assumption was that the combination of any type of flame guard structure with a fuel reservoir can amount to invention.

(*c*) It was assumed that an environmental change was the equivalent of a functional change.

(*d*) It was assumed either that defendant was not using the Rutz structure in its device, or that the adaption of that structure to a torch body amounted to invention.

(*e*) The Court overlooked clear statements in the specification in holding that: "No statement * * * requires * * * that the air inlet ports be located in the body of the cap."

(*f*) The Court's conclusion that the structure of the patent effected fuel savings and acted as a generator is not borne out by the record.

I.

The Court based its departure from the ruling of the Sixth Circuit upon the theory that new evidence was presented in the instant case, which may be summarized in the following statements from the opinion: "That others worked unsuccessfully to solve the problem (p. 3). The proof here * * * showed widely separated unsuccessful attempts * * *. Unsuccessful efforts were made over a long period by men skilled in the art of burners * * * (p. 4). Unsuccessful attempts have been made by competitors who have long been in the business of manufacturing and selling open flame torches * * *" (p. 5).

To support its theory in this regard, appellant produced two isolated instances. The first was that of a Superintendent of Way and Structures of the Detroit Street Railway, who in 1922 made one attempt to protect the flame by placing a flat shield over the top of the structure. This experiment continued from 1922 to 1924. It was abandoned, according to the witness, because the pin supporting the shield "would be bent and sometimes broken * * * and we still had trouble with

the torches being extinguished in a drenching rain or in a very high wind, and so we concluded that those happenings were so infrequent that we could just as well get along without the cap, and we discontinued the use" (Rec. 59, f. 176).

This evidence may be eliminated as a support for the Court's discussion of efforts by others in the industry. The experimenter was not a manufacturer of torches, there was no showing that he had any knowledge of combustion or of the structure of hydrocarbon burners. The showing is that he made but one experiment and that it was abandoned for reasons quoted above.

The other evidence offered is that of Currie, Works Manager for the Dietz Company, a large lantern manufacturer. While we have pointed out at some length in our brief (pp. 5, 26-27), the unreliability of Currie's evidence, the Court evidently drew the impression from his testimony that he had long been struggling with the problem. It is submitted that he had not. In 1928, something more than a year after the Toledo torch first came on the market, Currie found that it would not stand up in a "heavy rain. There was nothing to protect it at all" (Rec. 168, f. 504). During his experiments, he produced three devices, one of them being Exhibit 37, which "would operate with a much lower wick and withstand a very high wind" (Rec. 171, f. 511). He further testified: "I tried it out in the rain and it went out. It occurred to me that I might possibly put a flat shield over the top so that the rain would not get in the wick, that is, that thought must have

been in my mind, but I just didn't do it" (Rec. 175, f. 523). It is further significant that Currie, whose company maintained a complete file of patents, did not familiarize himself with the Rutz patent, for example, in 1928 when he was doing the work. He familiarized himself with that patent around 1930 or 1931 (Rec. 174, f. 520).

Such is the testimony which the Court says makes valid a patent heretofore held void for want of invention. We respectfully submit that it offers no foundation to support the conclusion that the art herein involved was one in which there had been a long, unsuccessful struggle to produce an efficacious device. It seems rather to be one in which the problem yielded readily to the first experimenter who seriously attacked it, to paraphrase the language of *National Electric Products Company* v. *Circle Flexible Conduit Company*, C. C. A. 2, 86 F (2nd) 84, 88.

A further comment on Currie's activities is that they were those of a conscious imitator. His company's lantern sales suffered when the Toledo torch came on the market in 1927 (Rec. 168 f. 502); during 1928 he experimented with the open flame torch and found that it would go out (Rec. 168, f. 504). During that year he produced Exhibit 37, which "would operate with a much lower wick and withstand a very high wind" (Rec. 171, f. 511). In January, 1929, Toledo put its protected torch on the market and in that year, Currie produced Exhibits 38 and 39, the latter being a housing somewhat similar to the housing for the new Toledo torch (Rec. 171, ff. 511-513). Subsequent-

ly, Currie's company took a license which, among other things, required that his testimony be available to plaintiffs (Rec. 173, f. 517). His testimony therefore should be considered in the same light as that of the officers of the plaintiff.

Currie, obviously, was not an independent researcher or an original thinker in this field. His activities, when studied, do not justify the impression which the Court received.

II.

It is respectfully submitted that the assumption that the combination of a flame guard and a torch body could be novel is not only in direct conflict with the conclusions which the Sixth Circuit reached upon different art than that here stressed, but it is also contrary to the disclosures in the record of the instant case.

A specific citation disclosing the combination of a torch body, wick and protecting burner is Patrick Wall's mill lamp, No. 228,497 of June 8, 1880 (Rec. 344). The patent drawings show a torch body A, a wick and wick tube E and a burner G. Inside of the burner is a little flame which burns "in a broad sheet" through the slot in the burner. We did not offer the patent as anticipatory since it does not have the imperforate top mentioned in the claims of the patent in suit. It was used to provide light in a rolling mill, where except for rain, conditions are not substantially different from those found outdoors. It shows beyond any basis for argument that the broad concept of surrounding the flame of a wick with some sort of a protective guard lacks novelty.

III.

We have relied strongly on Rutz, No. 1,101,146 as anticipating claims 11 and 12, and as giving defendant the right to use a similar structure, irrespective of the validity or invalidity of plaintiff's patent. The record shows that an actual Rutz burner, placed on a torch body, will perform as well as the structure of the patent drawings, including being qualified for sale as a truck flare (Rec. 413-423). It meets the severest of state laboratory tests. In the words of *Dwight & Lloyd Sintering Company* v. *Greenawalt*, 27 F. (2nd) 823; and *Ingersoll-Rand Company* v. *Worthington etc. Company*, 87 F. (2nd) 320: "It can be used without change for the purposes of the patent in suit."

Of Rutz, the Court has said: "Rutz had no problem of maintaining the flame under conditions of wind and rain" (pp. 7-8). In reaching such a conclusion, it is believed the Court overlooked the testimony of Oscar J. Liens (Rec. 391, 393), a man who was associated with Rutz in the manufacture of the device and who was familiar with the problems which Rutz sought to overcome. Objects which the inventor had in mind were to protect the flame from precipitated liquids and from lateral currents of air (Rec. 393, f. 1177). A pot which boils over precipitates a liquid with greater intensity than any rain, and a wind is a wind, whether it blows on the highway or through an open kitchen door.

Appellant does not contend that there was any *structural change* in the Rutz burner which was

qualified in Nebraska. The only change was *environmental.* This is no more than saying that patentee found "a new use" or environment for the Rutz burner. When placed in that new environment, without structural change, it will perform every function of the patent in suit. As we have previously pointed out, there is no novelty in placing a burner around a wick tube on a torch body, e.g. Wall, No. 228,497. It is therefore submitted that the Court's statement on page 9, referring to the combination of Rutz with a torch body, "this combination and use amounted to invention," was based on the erroneous assumption that the combination of a torch body and a burner involved inventive thought; the combination, in fact, was old and the novelty, if any, necessarily lay in the burner construction.

For this reason, we submit that claims 2 and 5, covering such a combination, are aggregative within the meaning of *Lincoln Engineering Company* v. *Stewart Warner Corporation,* 82 L. ed. Adv. p. 695. Claims 11 and 12 are not combination claims directed to the association of a burner and a torch body, but deal with a burner alone. If it be the holding of the Court that the Rutz burner does not anticipate the burner delineated in claims 11 and 12, defendant must necessarily be free to use that burner, because that which does not anticipate cannot infringe.

It is further submitted that the "unitary structure" theory put forward by plaintiffs and adopted by the Court is untenable when one of the elements of a "unitary structure" is a fuel reservoir.

Multiplication of examples shows the fallacy. In *Stromberg Motor Devices Company* v. *Zenith Detroit Corporation,* 25 F. (2nd) 567, a carburetor was held to be a unitary structure, Judge L. Hand dissenting. Can we suppose for a moment that the carburetor and the gas tank at the back of the automobile would have been held a unitary structure?

Yet, in an equivalent manner, that is what plaintiff is asking here. But given the burner, it takes no invention to combine it with a fuel reservoir, as anyone would know that a burner intended to protect a flame would not function without fuel.

Thus a boiler and a coal supply, an electric light and the dynamo in the power house, a carburetor and a gasoline tank, a street sprinkler and water supply (*In re Ratican,* 36 App. D. C. 95) cannot be unitary structures.

This distinction was pointed out in *Bassick Manufacturing Company* v. *Adams Grease Gun Corporation,* 52 F. (2nd) 36, 38 by Judge Swan, where it was said:

> "The invention in a combination is in the idea of combining the elements. They may all be old, but the combination may be patentable. A fortiori this may be true when one element is also new as was the pin fitting of the claims under discussion. The element may be patented alone, and the combination also, if new and an invention. *But the introduction of the new element into the combination may be obvious;* though by hypothesis the combination must be new, because there is a new element, the *substitution of this for its predecessors may be obvious once it appears.* Otherwise one could

> get an indefinite monopoly upon all possible combinations with anything which is itself an invention, e.g., upon the lid and the new patent lock which secures it, upon the fixture and the new patent gas which feeds it. Plainly you could not get a patent for such a combination, because, given the lock or the gas, it takes no invention to combine it with these things." (Italics ours.)

That the "introduction of the new element into the combination" was obvious in the instant case is abundantly apparent from the experiments of the patentees, shown on pages 271 to 287 of the record. The first attempt was a lateral housing for the flame (Rec. 271). Such improvement as took place was not in the torch body, not in the fuel, but solely concerned itself with the housing surrounding the flame. It was obvious at once, not only to the patentees, but also to Currie and Kerwin, said to have been unsuccessful investigators in the art, that what was needed was a housing for the flame.

Plainly, then, the Court has departed from well-recognized principles in holding that the combination of a fuel tank and a burner produces a unitary structure. If it does not, claims 2 and 5 must fail, and claims 11 and 12, must be distinguished from Rutz, which defendant uses.

IV.

The Court below found that defendant was using the Rutz structure (Rec. 430, Finding 7). This reference was not to the precise structure disclosed in the Rutz patent, but to the commercial struc-

ture manufactured by the Milwaukee Gas Specialty Company. The record, in fact, affords no testimony to the contrary, and plaintiff has had to take the position that, irrespective of the fact that the Rutz structure has long been in public use for protecting flames from wind and from the equivalent of rain, defendant cannot use the same without answering for patent infringement.

While this Court did not specifically make a finding as to the defendant's use of the Rutz structure, it did hold, on page 11 of the opinion, that the defendant is not free to use some or all of the separate elements of a combination simply because they existed in the prior art.

It is believed that the Court has here taken a substantial departure from its established precepts of the patent law.

The prior art affords examples of torch bodies, wick tubes and protective burners around the top of the wick tube; in Rutz it affords an example of a burner with an imperforate top, flame ports in the side and air inlets in the bottom. If defendant is not free to assemble these elements in any way that it sees fit, it must be because plaintiff's patent covers *a new use for the Rutz structure.* That it is not entitled to such *new use* has been held by this Court several times, c.f. *Dwight & Lloyd Sintering Company* v. *Greenawalt,* 27 F. (2nd) 823; *Ingersoll-Rand Company* v. *Worthington etc. Company,* 87 F. (2nd) 320.

V.

It is believed that the Court has misunderstood the statements of the patent specification when it says, on page 9 of the opinion:

> "No statement in the claims or specifications requires that the cap rest directly on the body of the torch, nor that the air inlet ports be located in the body of the cap."

The specification states (p. 1, 11, 78-87):

> "Air inlet openings 10 *being above the lower edge of the cap* leaves a space within the cap *and above the flange* of the wick holder for comparatively quiescent air. This quiescent layer of air in contact with the wick holder and the restriction of inlet ports to admit to the wick and holder only such air as is needed for combustion aids in maintaining the heat of the wick holder and wick." (Italics ours.)

This limitation must be completely disregarded to find infringement.

The air inlet ports *must be above the edge of the cap* if the device is to operate in accordance with the specification. In the defendant's device, there cannot be a layer of quiescent air under any conditions of operation (Rec. 91, f. 271). After a series of the most careful tests, Professor Croft of the University of Iowa concluded that there was a difference in performance of the plaintiff's and defendant's devices and "that the difference in performance of the two flares can be accounted for by the difference in construction of the two flares. That is, in the Toledo flare, the wick and flame

guard are adjacent to the top of the body of the flare *and the air ports are in the sides of the flame guard,* while in the Anthes flare the wick and receptacle are elevated above the body of the top of the flare *and the air ports are in the bottom of flame guard receptacle"* (Rec. 155, f. 464. (Italics ours.)

Thus the Court's assumption that patentees did not restrict themselves is unwarranted; the only form in which the device can operate as described is the form disclosed in the specification and patent drawings, with *the air inlet ports above the edge of the cap.* A claim is not to be taken alone. It must be considered in connection with the specification and drawings, and while a patent claim may cover more than is illustrated and described, it may not cover something contrary to what is illustrated and described.

VI.

In the Sixth Circuit case, where the evidence offered by plaintiff was substantially similar to that offered here, except for evidence of "unsuccessful efforts * * * made over a long period by men skilled in the art of burners," Judge Simons found:

> "Stripped of variations in nomenclature, and the ingeniously differentiated phrases of counsel, the invention is for a burner with a metal guard to protect the flame from air currents and rain" (Rec. 427).

It would unduly extend this petition to analyze the Court's findings to the contrary in the instant

case, but the impression received from a reading of the opinion is that the Court conceived the device of the patent in suit as a generator, performing unique functions in maintaining the heat of the wick, and saving fuel.

It is submitted that an analysis of the record in the instant case completely confirms Judge Simon's characterization of the patented structure. Professor Croft's careful tests proved that, other things being equal, the addition of a flame guard did not bring about a fuel saving except in conditions of still air (Rec. 154, f. 460). His findings in detail are set forth on pages 407 to 409 of the record. Plaintiff's only testimony on fuel saving is based on tests between an open flame torch much larger than the protected torch, with the wick of the open flame torch extended an inch and a half as against one-eighth of an inch for the protected torch (compare devices B and C., Rec. 261). Professor Croft's tests showed that the one-half inch extension gave the best results (Rec. 397) and this accords with the practice of the Detroit Street Railway (Rec. 58, f. 173-174), which still uses the open flame torch.

Plaintiff's own expert shows that the principal factor in maintaining wick heat is the flame (Rec. 215-219, XQ 83, 100, 101, 104, 123-126), and the record also shows that the possibilities of conducting heat to the wick were public property long before patentees filed their application (Rec. 81, f. 241-242, referring to Luckiesh on Artificial Light, p. 60). As plaintiff's expert states in reference to maintaining wick heat (Rec. 232, XQ. 241):

"You can design a thing for it to become hot, and you can design for it not to become hot, prevent it from becoming hot, and you can leave it alone to take its course. You can do any one of these three things."

From all of which would appear that patentees were using known methods to produce known results in designing the structure of the patent in suit.

Conclusion.

It is respectfully urged that this Court critically reexamine this record in the light of its opinion. It is earnestly contended that the patent law does not give its monopoly to an improvement so obvious as the combination of a guard with an open flame torch to protect the flame from wind and rain. More than this, the patentee in the instant case did not do. Improvements in an art, to be patentable, must rise to a higher level of creative thought than that, apart from the test of novelty.

If defendant cannot combine a burner which preceded the patent in public use by thirteen years with a torch body whose use goes back beyond the memory of man, when other burners have been so combined with torch bodies at least as early as 1880, it seems desirable to have the grounds of the patentee's monopoly distinctly pointed out.

A clear-cut conflict between the circuits is shown. A District Judge in the Sixth Circuit found the patent valid and infringed. The Circuit Court of Appeals for the Sixth Circuit, without dissent, found the patent to be invalid. A Dis-

tric Judge for the Second Circuit found the patent to be invalid. The present decision is by a divided court.

All of which is respectfully submitted.

ANTHONY WILLIAM DELLER,
Solicitor for Appellee.

CARL V. WISNER, JR.,
Of Counsel.

We, Anthony William Deller, solicitor for appellee in the above-entitled cause, and Carl V. Wisner, Jr., of counsel therein, do hereby certify that the foregoing petition for rehearing is, in our opinion, well taken in point of law and has not been filed herein for purposes of delay.

ANTHONY WILLIAM DELLER,
CARL V. WISNER, JR.

[fol. 469] UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

THE TOLEDO PRESSED STEEL COMPANY, Plaintiff-Appellant,

against

MONTGOMERY WARD & COMPANY, INC., Defendant-Appellee

Before: Manton, Swan and Chase, Circuit Judges

Anthony William Deller, Solicitor for Appellee. Carl V. Wisner, Jr., of Counsel.

Per CURIAM:

Petition for rehearing denied.

——— ———, Circuit Judges.

Filed Dec. 5/38.

[fol. 470] UNITED STATES CIRCUIT COURT OF APPEALS, SECOND CIRCUIT

At a stated term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the United States Court House, in the City of New York, on the 5th day of December, one thousand nine hundred and thirty-eight.

Present: Hon. Martin T. Manton, Hon. Thomas W. Swan, Hon. Harrie B. Chase, Circuit Judges.

TOLEDO PRESSED STEEL COMPANY, Plaintiff-Appellee,

vs.

MONTGOMERY WARD & COMPANY, INC., Defendant-Appellee

A petition for a rehearing having been filed herein by counsel for the appellee;

Upon consideration thereof, it is

Ordered that said petition be and hereby is denied.

Wm. Parkin, Clerk.

[fol. 471] [Endorsed:] United States Circuit Court of Appeals, Second Circuit. Toledo Pressed Steel Company vs.

Montgomery Ward & Company, Inc. Order. United States Circuit Court of Appeals, Second Circuit. Filed Dec. 5, 1938. William Parkin, Clerk.

[fol. 472] UNITED STATES CIRCUIT COURT OF APPEALS, SECOND CIRCUIT

At a stated term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the United States Court House, in the City of New York, on the 7th day of December, one thousand nine hundred and thirty-eight.

Present: Hon. Martin T. Manton, Hon. Thomas W. Swan, Hon. Harrie B. Chase, Circuit Judges.

TOLEDO PRESSED STEEL COMPANY, Plaintiff-Appellant,

vs.

MONTGOMERY WARD & COMPANY, INC., Defendant-Appellee

Appeal from the District Court of the United States for the Eastern District of New York

This cause came on to be heard on the transcript of record from the District Court of the United States for the Eastern District of New York, and was argued by counsel.

On Consideration Whereof, it is now hereby ordered, adjudged, and decreed that the decree of said District Court be and it hereby is reversed with costs.

It is further ordered that a mandate issue to the said District Court in accordance with this decree.

Wm. Parkin, Clerk.

[fol. 473] [Endorsed:] United States Circuit Court of Appeals, Second Circuit. Toledo Pressed Steel Company vs. Montgomery Ward & Company. Order for Mandate. United States Circuit Court of Appeals, Second Circuit. Filed Dec. 7, 1938. William Parkin, Clerk.

[fol. 474] UNITED STATES OF AMERICA,
Southern District of New York:

I, William Parkin, Clerk of the United States Circuit Court of Appeals for the Second Circuit, do hereby certify

that the foregoing pages, numbered from 1 to 473, inclusive, contain a true and complete transcript of the record and proceedings had in said Court, in the case of Toledo Pressed Steel Company, Plaintiff-Appellant, against Montgomery Ward & Company, Inc., Defendant-Appellee, as the same remain of record and on file in my office.

In Testimony Whereof, I have caused the seal of the said Court to be hereunto affixed, at the City of New York, in the Southern District of New York, in the Second Circuit, this seventh, day of December, in the year of our Lord one thousand nine hundred and thirty-eight, and of the Independence of the said United States the one hundred and sixty-*h*tird.

Wm. Parkin, Clerk. (Seal United States Circuit Court of Appeals, Second Circuit.)

[fol. 475] SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed February 6, 1939

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Second Circuit is granted, and the case is assigned for argument immediately following Nos. 166 and 167.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.

FILE COPY

Office - Supreme Court, U. S.
FILED
JUL 1 1938
CHARLES ELMORE CROPLEY.
CLERK

IN THE

Supreme Court of the United States

October Term, 1937

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

v.

STANDARD PARTS, INC.,
Respondent.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

v.

HUEBNER SUPPLY COMPANY,
Respondent.

PETITION FOR WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT AND BRIEF IN SUPPORT THEREOF; AND MOTION TO DEFER CONSIDERATION OF PETITION

WILBER OWEN,
Attorney for Petitioner

IN THE

Supreme Court of the United States

October Term, 1937

No. .....

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

v.

STANDARD PARTS, INC.,
Respondent.

No. .....

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

v.

HUEBNER SUPPLY COMPANY,
Respondent.

PETITION FOR WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT AND BRIEF IN SUPPORT THEREOF; AND MOTION TO DEFER CONSIDERATION OF PETITION

WILBER OWEN,
Attorney for Petitioner.

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IN THE

Supreme Court of the United States

October Term, 1937

No. .....

THE TOLEDO PRESSED STEEL COMPANY,
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THE TOLEDO PRESSED STEEL COMPANY,
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HUEBNER SUPPLY COMPANY,
Respondent.

PETITION FOR WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT AND BRIEF IN SUPPORT THEREOF; AND MOTION TO DEFER CONSIDERATION OF PETITION

PETITION

To the Honorable the Chief Justice and the Associate Justices of the Supreme Court of the United States:

The Toledo Pressed Steel Company respectfully

prays that writs of certiorari issue to review the decrees of the United States Circuit Court of Appeals for the Sixth Circuit, entered in the above entitled cases on December 7th, 1937 (R. 284), reversing decrees of the District Court of the United States for the Northern District of Ohio, Western Division (R. 283, 284). A certified transcript of the record in these cases, with the necessary additional copies thereof, has been filed in compliance with Rule 38 of the rules of this court.

Summary and Short Statement

The petitioner and both respondents are corporations organized under the laws of Ohio. In January, 1934, the petitioner filed bills of complaint against the respondents in the United States District Court for the Northern District of Ohio, Western Division, charging infringement of United States Letters Patent No. 1,732,708, issued to the petitioner on October 22, 1929, for Burner, on an application filed by its president and vice-president, Joseph E. Withrow and Lyman W. Close (R. 156). The cases were heard together before the late Judge Hahn, who filed a single opinion (R. 21) and entered decrees finding the patent valid and infringed (R. 30, 32). Respondents appealed to the Sixth Circuit Court of Appeals. A single record was made up and the cases were heard together by that court, which entered decrees reversing the decrees of the District Court and ordering the bills of complaint dismissed for want of invention. The petitioner filed a petition for rehearing (R. 287) which was denied on March 16, 1938 (R. 303).

The patent is for a burner for a construction torch. Figure 3 of the patent with claims 2 and 11 applied thereto is shown on page 160 of the record and respondent's devices with the same claims applied are shown on pages 161 and 162 of the record.

The principal use of devices made under the patent is to warn the traveling public at night of the presence of excavations or obstructions on the public highways.

Torches made by the petitioner embodying the invention of the patent in suit and others embodying the claimed combinations of elements are the only warning signals which are able to withstand the tests prescribed by various state highway departments for use in connection with trucks and buses parked at night on the public highways.*

The torches manufactured by the petitioner and the accused devices pass all of these state tests and are sold extensively for such purpose. (See circulars of respondent's flares at pages 197, 198 and 222 of the record.)

The old type open-flame torches, in use by contractors and others since time out of mind, do not pass these state requirements and hence are not available for use as warning signals for parked trucks and buses, and red

---

*A typical state law is that of Iowa, which provides (R. 80):

"Section 1. Motor trucks and combinations thereof operating on the highways during the period from one-half (½) hour after sunset to one-half (½) hour before sunrise shall at all times be equipped with portable flares which may be plainly visible for a distance of five hundred (500) feet. The operator of a motor truck or combination shall, immediately upon bringing his vehicle to a stop upon or immediately adjacent to the traveled portion of the highway at any time during the period from one-half (½) hour after sunset to one-half (½) hour before sunrise, place a flare at the side of such vehicle and in plain view of all traffic, and shall maintain it in such position during the time such vehicle remains parked."

Under this law the Public Utilities Commission of Iowa adopted the following regulations for drivers of trucks and buses (R. 80):

"Place lighted pot torches 100 full steps ahead and behind the vehicle at least one full step out in the road, and a lighted pot torch along the side of the vehicle which others pass. * * *"

Under this authority the Iowa State Highway Commission prescribed tests as follows (R. 210-211):

(a) The torch must remain lighted at least thirty seconds in a forty-mile per hour wind and burn continuously in a twenty-six-mile per hour wind.

(b) The torch must burn at least five minutes in a twenty-six-mile per hour wind with rain applied at the rate of 2.48 inches per hour.

(c) The carbon deposit must be light and the flare pass the two preceding tests after two hours' operation in a quiet atmosphere.

(d) The torch must remain lighted for at least eight hours.

lanterns are not acceptable as warning signals on the public highways because they cannot be distinguished from the tail-lights of automobiles (R. 69, 78).

The invention of the patent, because it provides an effective and reliable warning signal, has been and is of great benefit to the public.

The patented torch was developed as a result of numerous complaints received by petitioner from users of the old type open-flame torch which it had been manufacturing for a number of years (R. 52-56). Petitioner's patented torch was placed on the market in January, 1929, and promptly superseded the old type open-flame torch for such uses as were then open to it (R. 69).

Petitioner's principal competitors in the manufacture and sale of the old type open-flame torch prior to the introduction of the patented torch—McCloskey Torch Company, of Toledo, Ohio, and R. E. Dietz Company, of New York—commenced the manufacture and sale of torches embodying the patented combinations shortly after the patented torch was placed on the market by the petitioner.*

Prior to the decrees entered by the District Court three manufacturers had taken licenses under the patent in suit, and subsequently three other manufacturers, including said R. E. Dietz Company, took licenses.

The irregular, unsteady flame of the old open torch was ideal as a warning signal, but it was unreliable. It would go out in heavy rains and high winds. The problem which confronted the patentees was how to preserve this desirable character and quality of flame in stormy weather without obscuring it from view by placing a guard around it. To guard the flame itself from wind and rain naturally would destroy its utility as a warning signal. The problem was how to preserve the visibility

*This fact is referred to in Judge Hahn's opinion (R. 22).

of this flame and at the same time provide means to insure its maintenance in stormy weather, when most needed as a warning signal.

To accomplish this the patentees conducted a long series of experiments, constructing and testing many burners under actual outdoor conditions.* Necessarily they must work in a restricted field. The fuel must be cheap, safe to handle and available everywhere, this meant kerosene. The torch must be of sturdy construction because subjected to rough handling and usage, which eliminated glass protectors. The device must be of simple and cheap construction, which meant that the kerosene must be fed to the burner by a wick and not by air pressure, requiring a pump. The burner which they finally produced and patented operates as follows:

The exposed end of the wick is surrounded by an apertured cap which performs the double function of protecting the source of the flame from wind and rain and of heating the oil in the wick above the flash point so as to produce an ample supply of hydrocarbon vapor to burn partially within the cap, but mainly outside the cap where it provides an open unguarded flame under all weather conditions.

This operation is described at lines 68 to 89 of page 1 of the patent and is confirmed by the advertisements of respondents and others (R. 157).

The Court of Appeals treated the invention as being for nothing more than a flame guard. It said, "The invention is for a burner with a metal guard to protect the flame from air currents and rain" (R. 285, near bottom), and observed that the art disclosed a number of metal guards for burners.

Not one of the patents referred to by the Court of Appeals as illustrative of "metal guards for burners"

*Some of the experimental burners are illustrated in Exhibits 7 and 10-A to 10-J (R. 168-180).

was intended for the same use as is the burner of petitioner's patent, and the proofs do not show that any of them is capable of performing the function of converting kerosene into hydrocarbon vapor in a protected chamber and burning it partially within the chamber but mainly outside the chamber where it will continue to burn and provide a warning signal in stormy weather.

The advertising literature of one of the respondents contains the following statement, which is amply supported by the proofs (R. 197):

> "The specially constructed burner will continue to burn in a forty-mile gale and is not affected by rain or storm. The heat generated in this burner converts the fuel to a gas and only the gas burns. This adds a long life to the wick."

The circular of the other respondent contains the following (R. 222):

> **"GENUINE BOLSTER FLARES*—FOR SAFETY**
>
> **This Safety Feature PREVENTS Accidents**
>
> "Liability insurance can rebuild a crashed car—pay a hospital bill—compensate for lost time, but it can't return the dead to life, or repair shocked and shattered nerves.
>
> "Protect yourself against the grief and pain of hurting others. Do your part to prevent the thousands of motor car accidents that occur every year because of stalled trucks, buses and cars being struck by speeding cars. Hundreds of thousands of others are barely avoided. Thousands of lives are lost—more thousands of people injured—millions of dollars worth of property damaged.
>
> "Your own good judgment says 'Use Flares.' Comparison and common sense say Use the Best Flares—the Genuine Bolser Flares—road tested and time tried.
>
> "Bolser Flares are your safety insurance. They are always ready for use—quickly set out or picked up—and more efficient than the law requires."

*"Flare" is the commercial name for torches used as warning signals for parked trucks and buses.

In advertising a burner which the petitioner then claimed to infringe and which since has been licensed, R. E. Dietz Company said (R. 203):

> "* * * A flare burner, despite its apparently simple construction, is really a kerosene carburetor, and must be made right to control and feed the kerosene gases and oxygen to the flame, also to protect the flame from the elements."

The trial court which heard the testimony appreciated the fact that the **invention was not of a flame guard.** Judge Hahn said a study of the patent "shows that the essence of the invention here is protection of the flame at the source, * * *." (R. 28.)

The patented torch resulted in a saving of more than 50% in kerosene consumption and of practically 100% in wick consumption as compared with the old type open-flame torch, and respondents' Bolser and K-K flares show substantially the same economies (R. 185-189).

Notwithstanding the above undisputed facts and because there was "no substantial evidence of effort general to the industry" to solve the problem prior to its solution by petitioner's patentees, the Court of Appeals substituted its intuition or divination of what was easy and apparent for the actual experience of those skilled in the art and held the patent invalid for want of invention.

Question Presented

The sole question is—

Whether a patentee who "has added a new and valuable article to the world's utilities,"* in order to sustain his patent against the defense of lack of invention, must prove affirmatively an "effort general to the industry to

---

*Diamond vs. Consolidated Tire Co., 220 U. S. 428, 435.

solve a problem which long defied it"** in addition to proving that the patented device (a) promptly superseded older devices in use for similar purposes for many years, (b) is acceptable and largely used in fields not available to the older devices, (c) has resulted in a saving of more than 50% in the cost of operation over the older devices, and (d) that the patent has been recognized by a number of other manufacturers who have taken out licenses thereunder.

Reasons Relied on for Granting the Writ

1. Because the Circuit Court of Appeals has decided an important question of Federal law which has not been, but should be, settled by this court.

2. Because the decision of the Circuit Court of Appeals tends to establish a different rule as to lack of invention in combination claims from that established by this court.

Wherefore, your petitioner prays that writs of certiorari issue to the United States Circuit Court of Appeals for the Sixth Circuit, commanding said court to certify and send to this court on a day to be designated, a full and complete transcript of the record of all the proceedings of the Circuit Court of Appeals had in these cases, to the end that these cases be reviewed and determined by this court; that the judgments of the Circuit Court of Appeals reversing the decrees of the District Court be reversed, and that the petitioner be granted such other and further relief as may seem proper.

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

WILBER OWEN,
Attorney for Petitioner.

**The Court of Appeals opinion states (R. 285, 286): "• • • There is here no substantial evidence of effort general to the industry to solve a problem which long defied it. • • •"

BRIEF IN SUPPORT OF THE PETITION

Opinions Below

The opinion (not reported) of the District Court of the United States for the Northern District of Ohio, Western Division, appears at pages 21 to 29 of the record, and the opinion of the United States Circuit Court of Appeals for the Sixth Circuit (R. 284) is reported in 93 Fed. (2d) 336.

Jurisdiction

The decree of the Circuit Court of Appeals was entered on December 7, 1937 (R. 284). A petition for rehearing (R. 287) was denied March 16, 1938 (R. 303). The time for filing the petition for certiorari herein was extended to July 1, 1938, by an order of Mr. Justice McReynolds entered June 14, 1938 (R. 304). The jurisdiction of this court is invoked under Section 240(a) of the Judicial Code, as amended by the Act of February 13, 1925; U. S. C. Title 28, Section 347(a).

Statement of the Case

The principal facts pertinent to the single question involved are sufficiently stated in the petition, *ante*, pages 2 to 7.

Specification of Errors

1. The Circuit Court of Appeals for the Sixth Circuit erred in reversing and in not affirming the decrees of the District Court finding the patent in suit valid and infringed.

2. The said court erred in substituting its own intuition or divination of what was easy and apparent for the actual experience of those skilled in the art at and prior to the date of invention.

3. The said court erred in disregarding the presumption of validity arising from the granting of the patent and in placing on the petitioner the burden of affirmatively establishing validity instead of requiring respondents to establish invalidity.

4. The said court erred in holding that any mechanic skilled in the art could have produced the burner of the patent in suit by combining the open-flame torch of the prior art and a flame guard taken from the indoor burner art, such, for example, as a guard for a pilot light on a kitchen gas stove.

ARGUMENT

The Importance of the Question Involved

The Court of Appeals, in holding the patent in suit invalid for want of invention, disregarded the long established rule of this court, restated in *Radio Corporation of America vs. Radio Engineering Laboratories, Inc.*, 293 U. S. 1, 2 and 7, "that **one otherwise an infringer** who assails the validity of a patent fair upon its face **bears a heavy burden of persuasion**, and fails unless his evidence has more than a dubious preponderance. * * *" (Emphasis ours.)

Instead of placing the burden on the respondents to establish invalidity of the patent, the Circuit Court of Appeals placed the heavy burden on the petitioner of proving that others had attempted to solve the problem and failed.

The Court of Appeals in holding the invention to be "for a burner with a metal guard to protect the flame from air currents and rain," failed to recognize the real invention, which was the provision of a vapor generating means inside a protected chamber where it is unaffected by weather conditions, the vapor burning partially inside.

the protected chamber to maintain the kerosene above the flash point, but mainly outside that chamber where it burns as an unprotected warning signal under all kinds of weather conditions. The District Court which heard the testimony appreciated the fact that the invention was not of a flame guard. It said, a study of the patent shows that the "essence of the invention here is protection of the flame at the source * * *." (R. 28.)

That any mechanic skilled in the art having a knowledge of the patent in suit or of devices made under it might now be able to produce the patented device by adapting flame guards of earlier patents intended for use in other surroundings and combining them with the old type open-flame torch, does not militate against the right of patent protection to those who were the first to discover and disclose the possibility of so doing. *Clough vs. Barker*, 106 U. S. 166, 176; *Eibel Process Co. vs. Minnesota & Ontario Paper Co.*, 261 U. S. 45.

The oft-quoted statement by Mr. Justice Blatchford in *Clough vs. Barker* applies to the facts of the present case without qualification. No structure of the prior art was designed for the same purpose as Withrow and Close's, no person looking at the prior art structures or using them would understand that they were to be used in the way Withrow and Close's is used, and none of them is shown to have been really used and operated in that way.

In the *Eibel Process* case, the patentee after studying the problem concluded that the trouble could be obviated by increasing the speed of the flowing stock to approximately the speed of the wire, and to accomplish this "he proposed to add to the former speed of the stock by substantially tilting up the wire and giving the stock the added force of downhill flow." This he confirmed by actual trial.

The inventions in the *Clough* and *Eibel Process* cases lay in the conception that the problem confronting the inventor could be solved by a slight change of location of one part of a structure of the prior art. The Clough patent was for a gas burner which provided a supplementary supply of gas. The prior art contained the Horace R. Barker burner which, without change of structure, but by an adjustment of parts not intended, could be used to provide an additional supply of gas to the flame. In holding the Clough patent valid, the court said (p. 175):

> "The testimony as to any additional or supplementary supply of gas in the Horace R. Barker burner amounts really to this only,—that if that burner is used now in a way in which it was never designed to be used, and is not shown to have ever been used before Clough's invention, it may be made to furnish a supplementary supply of gas."

In the *Eibel Process* case the change which was held to involve invention consisted in tilting up the frame carrying the wire which supported the paper stock so that the flow of the stock would be increased by gravity and thereby "maintain equality of speed between stock and wire at the crucial point, * * *."

Even if the Court of Appeals were correct in its assumption (of which there was no proof) that any skilled mechanic could have combined a flame guard of the prior art with the old open-flame McCloskey torch and thus produce a device which would operate in accordance with the disclosure of the patent in suit, it erred in assuming that any mechanic skilled in the art should have conceived the possibility of overcoming the objection to the open-flame torch by thus combining structures which never before had been combined.

It is not denied that the patentees, as a result of their long series of experiments, "added a new and val-

uable article to the world's utilities." That one who has accomplished such a result is entitled to protection as an inventor, even though he proceeded by the "cut and try" method, is settled law.

In *Diamond Rubber Company vs. Consolidated Tire Co.*, 220 U. S. 428, 435, this court said:

> " • • • A patentee may be baldly empirical, seeing nothing beyond his experiments and the result; yet if he has added a new and valuable article to the world's utilities he is entitled to the rank and protection of an inventor."

In the *Eibel Process* case, this court said, "The first and most important question is whether this was a real discovery of merit." (261 U. S. 45, 52.)

That the patentees made a "real discovery of merit" when they learned as a result of their experiments that the old open-flame wick burner could be converted into a kerosene carburetor by placing a metal guard around the source of the flame, but not around the flame itself, cannot be doubted in view of the following:

1. The highly desirable quality and character of the flame of the old type open-flame torch, as a warning signal, has been preserved.

2. The source of the flame has been so protected that the flame will continue to burn and operate as a warning signal under weather conditions which extinguished the flame of the old type torch (R. 188).

3. Fuel consumption has been reduced more than one-half (R. 185-188).

4. Wick consumption, which was very high in the old type torch, has been practically eliminated (R. 189).*

---

*Due to the fact that the wick of the old type torch was exposed 1½" or more, the flame burned from the wick and the wick was consumed. In the patented burner only ⅛" of wick is exposed and instead of the flame burning from the wick, hydrocarbon vapors are produced which burn away from the wick and principally outside the guard.

Confusion and Uncertainty in Decisions of Lower Courts as to What Constitutes Invention

Because in a number of cases before this court in recent years the patents have been held invalid for lack of invention, there is a growing tendency on the part of lower courts to invalidate patents for meritorious advances.

This court always has recognized that the simplicity of an invention and its apparent obviousness after the event are misleading and unreliable bases on which to determine the question of invention.

In *Loom Company vs. Higgins*, 105 U. S. 580, 591, the court said:

> "* * * This argument would be sound if the combination claimed by Webster was an obvious one for attaining the advantages proposed,—one which would occur to any mechanic skilled in the art. But it is plain from the evidence and from the very fact that it was not sooner adopted and used, that it did not, for years, occur in this light to even the most skillful persons. * * * Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements **produce a new and beneficial result**, never attained before, it is evidence of invention." (Emphasis ours.)

In *Potts vs. Creager*, 155 U. S. 597, 608, the court pointed out that it is immaterial that "after the thing has been done, it appears to the ordinary mind so simple as to excite wonder that it was not thought of before. The apparent simplicity of a new device often leads an inexperienced person to think that it would have occurred to any one familiar with the subject; but the de-

cisive answer is that with dozens and perhaps hundreds of others laboring in the same field, it had never occurred to any one before. The practiced eye of an ordinary mechanic may be safely trusted to see what ought to be apparent to every one."

In *Expanded Metal Co. vs. Bradford*, 214 U. S. 366, 381, the court said:

> "• • • The fact that the invention seems simple after it is made does not determine the question; if this were the rule many of the most beneficial patents would be stricken down."

See also

Krementz vs. Cottle Co., 148 U. S. 556;
DuBois vs. Kirk, 158 U. S. 58;
Hobbs vs. Beach, 180 U. S. 383;
Carnegie Steel Co. vs. Cambria Iron Co., 185 U. S. 403.

No recent decision of this court disturbs this long established rule, yet the present tendency of the lower courts is to substitute their own ideas of what should have been obvious to those skilled in the art for the actual facts of record, which in the present case all point to the presence of invention.

In *Richmond vs. U. S.*, 275 U. S. 331, the court sustained a patent for what might have appeared to be an obvious advance, because it cut down costs, had not occurred to any one before, and superseded older structures, all of which facts are present here. There was no evidence that others had tried and failed.

The evidence shows great commercial success. The patented device promptly superseded other devices which had been in common use for many years. The merits of the advance were recognized by three other prominent manufacturers who took licenses prior to the time when the District Court held the patent valid and infringed.

This court has frequently held that "where the question of novelty is in doubt, the fact that the device has gone into general use, and displaced other devices employed for a similar purpose, is sufficient to turn the scale in favor of the invention." *Potts vs. Creager*, 155 U. S. 597, 609; *Smith vs. Goodyear*, 93 U. S. 486, 495.

In *Diamond Rubber Co. vs. Consolidated Tire Co.*, 220 U. S. 428, Mr. Justice McKenna stated (page 435):

> "But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. It regards a change as evidence of novelty, the acceptance and utility of change as a further evidence, even as a demonstration."

CONCLUSION

We submit that the granting of writs of certiorari in these causes would be appropriate because the question involved is one upon which considerable diversity of opinion exists. A rule of law applicable to a large number of cases involving the question of invention would be clarified by a decision of this court in these causes.

Wherefore, it is respectfully prayed that writs of certiorari be issued.

Wilbur Owen,
Attorney for Petitioner.

IN THE
SUPREME COURT OF THE UNITED STATES

October Term, 1937

No. .....

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

v.

STANDARD PARTS, INC.,
Respondent.

No. .....

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

v.

HUEBNER SUPPLY COMPANY,
Respondent.

MOTION TO DEFER CONSIDERATION OF PETITION

Now comes the Petitioner, The Toledo Pressed Steel Company, and moves that consideration of the foregoing petition for certiorari in these causes be deferred pending the decision of the United States Circuit Court of Appeals for the Second Circuit in the cause entitled *The Toledo Pressed Steel Company, Plaintiff-Appellant, vs. Montgomery Ward & Co., Inc., Defendant-Appellee,* Docket No. 16071, and, in support thereof, shows:

1. There is now pending before the United States Circuit Court of Appeals for the Second Circuit, an appeal from the District Court of the United States for the Eastern District of New York, in which the petitioner herein is appellant and Montgomery Ward & Co., Inc., is appellee. Said appeal was docketed on or about June 2, 1938, a certified copy of the transcript of record and the brief for appellant were then filed.

2. Appellee's brief in said cause will be filed on or before July 31, 1938, and the cause will be ready for hearing when the Court of Appeals convenes next October. Counsel for petitioner is informed and believes that said cause will be heard by the Second Circuit Court of Appeals in October and that the decision will be rendered promptly thereafter.

3. The principal question to be decided by the Second Circuit Court of Appeals in said cause is the validity of Withrow and Close Patent No. 1,732,708, which is the same patent and the same question involved in the proceedings before United States Circuit Court of Appeals for the Sixth Circuit, which proceedings the accompanying petition for certiorari seeks to have reviewed by this court.

4. The question of infringement involved in said cause in the Second Circuit Court of Appeals is substantially the same question of infringement which was involved in the above entitled causes, which question was decided in favor of the petitioner by the District Court and was not disturbed by the decision of the Sixth Circuit Court of Appeals.

5. Petitioner will inform this court of the decision of the Second Circuit Court of Appeals as soon as the same is rendered.

6. Should the decision of the Second Circuit Court of Appeals in said cause hold the said patent valid, petitioner will ask leave to amend its petition for certiorari to allege such fact.

WILBER OWEN,
Attorney for Petitioner.

I hereby certify that the foregoing motion is, in my opinion, well founded and is not made for purposes of delay.

WILBER OWEN,
Attorney for Petitioner.

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IN THE

Supreme Court of the United States

October Term, 1938

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,
vs.
STANDARD PARTS, INC.,
Respondent.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,
vs.
HUEBNER SUPPLY COMPANY,
Respondent.

No. 603

MONTGOMERY WARD & COMPANY,
Petitioner,
vs.
THE TOLEDO PRESSED STEEL COMPANY,
Respondent.

BRIEF FOR THE TOLEDO PRESSED STEEL CO.

WILBER OWEN,
Solicitor for The Toledo Pressed Steel Company.

SAMUEL E. DARBY, JR.,
Of Counsel.

IN THE

Supreme Court of the United States

October Term, 1938

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

STANDARD PARTS, INC.,
Respondent.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

HUBBNER SUPPLY COMPANY,
Respondent.

No. 603

MONTGOMERY WARD & COMPANY,
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THE TOLEDO PRESSED STEEL COMPANY,
Respondent.

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IN THE

Supreme Court of the United States

October Term, 1938

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
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vs.

STANDARD PARTS, INC.,
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THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

HUBBNER SUPPLY COMPANY,
Respondent.

No. 603

MONTGOMERY WARD & COMPANY,
Petitioner,

vs.

THE TOLEDO PRESSED STEEL COMPANY,
Respondent.

BRIEF FOR THE TOLEDO PRESSED STEEL CO.

Nature of the Cases

These are patent infringement suits brought by The Toledo Pressed Steel Company as owner of Withrow and Close patent No. 1,732,708 for a Burner for use in outdoor warning signals, such as construction torches and truck flares.

Defendants-respondents in cases 166 and 167 are auto-accessory dealers in Toledo, Ohio, which sell truck flares manufactured respectively by The Bolser Corporation, of Des Moines, Iowa (known as the Bolser flare), and by Kari-Keen Manufacturing Company, of Sioux City, Iowa (known as the Kari-Keen flare), and Montgomery Ward & Company, petitioner-defendant in case No. 603, sells truck flares manufactured by Anthes Force Oiler Company, of Fort Madison, Iowa (known as the Anthes flare).

In each case the manufacturer of the flare charged to infringe has assumed and is conducting the defense.

Opinions of the Courts Below

The late Judge Hahn, in the District Court for the Northern District of Ohio, Western Division, held the patent valid, that the Bolser flare infringed claims 2, 5, 11, 12 and 13, and that the Kari-Keen flare infringed claims 1, 2, 5, 6, 7, 11, 12 and 13. The cases were heard together and a single opinion rendered. The opinion is not reported, but is found at pages 21 to 29 of the Ohio record. The Court of Appeals for the Sixth Circuit reversed the decrees of the District Court on the ground of invalidity for want of invention.[1]

In case No. 603, Judge Moscowitz, in the District Court for the Eastern District of New York, held the patent invalid and dismissed the bill, relying on the decision of the Sixth Circuit Court of Appeals.[2]

The Court of Appeals for the Second Circuit reversed the decree and held the patent valid and claims 2, 5, 11 and 12 infringed by the Anthes flare.[3]

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1 93 Fed (2) 336; Ohio R. 284.
2 37 P. Q. 318; N. Y. R. 424.
3 99 Fed. (2) 806; N. Y. R. 447.

Jurisdiction

Cases 166 and 167 are here on writ of *certiorari* granted by this court on November 21, 1938, and case No. 603 is here on writ of *certiorari* granted by this court on February 6, 1939, jurisdiction in all these cases having been invoked under Section 347a, U. S. Code, Title 28.

Assignment of Errors in Cases 166 and 167

1. The Court of Appeals for the Sixth Circuit erred in reversing and in not affirming the decrees of the District Court finding the patent valid and infringed.

2. The said court erred in substituting its own intuition or divination of what was easy and apparent for the actual experience of those skilled in the art at and prior to the date of invention.

3. The said court erred in disregarding the presumption of validity arising from the granting of the patent and in placing on the petitioner the burden of affirmatively establishing validity instead of requiring respondents to establish invalidity.

4. The said court erred in holding that any mechanic skilled in the art could have produced the burner of the patent in suit by combining with the open-flame torch of the prior art a flame guard taken from the indoor burner art, such, for example, as a guard for a pilot light on a kitchen gas stove.

Statement of the Case

The patent is directed to the provision of a burner for signal torches[4] which will remain lighted in heavy

[4] Commonly referred to as "construction torches" when used by contractors, and as "flares" when used as warning signals for parked trucks or busses.

winds and rains. Since time out of mind torches of this general type have been in use for guarding obstructions and excavations on public highways. Prior to the invention of the patent in suit these consisted of a metal container for oil having a wick opening in the top and a cylindrical cotton wick extending from the oil a substantial distance outside the container. The flickering, wavering luminescent flame from these torches made an excellent warning signal, but they were unreliable because the flame would be extinguished by heavy winds and rains, especially in cold weather.

In 1925 The Toledo Pressed Steel Company, owner of the patent in suit, began the manufacture of these open-flame torches with sheet metal bodies,[5] at first in the form shown in McCloskey patent 1,610,301, known as the McCloskey torch,[6] and beginning in 1926 in the form shown in Close patent 1,613,819, known as the "Toledo" torch.[7] It found that these torches would not stay lighted in bad weather, with the result that there would be no warning signal when one was most needed. Many complaints were received from users of these torches,[8] and in an effort to overcome this fault the manufacturer recommended that the wick be extended 1½ inches or more.[9] Still complaints came in and in the spring of 1928 the inventors, Withrow and Close, president and vice-president respectively of The Toledo Pressed Steel Company, began an intensive study of the problem in an effort to produce a torch which would remain lighted in bad weather. In the course of their experiments, which con-

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[5] Previously they had been of cast iron.

[6] Ohio R. 279.

[7] Ohio R. 281.

[8] See Ohio R. 53 to 56, for excerpts from a number of them.

[9] To each torch sold was attached a tag reading: "A normal length of exposed wick is about 1½ inches. Extend the wick further for heavy weather conditions." (Ohio R. 167.)

tinued until late in the fall, they built and tried out a large number of burners, testing each in turn against the best previous experimental burner, and finally developed the burner of the patent in suit.[10]

The patent was applied for on December 26, 1928, and the patented torch first placed on the market late in January of 1929, and promptly superseded the older type torch. The patented burner was made interchangeable with the old type "Toledo" burner and a large proportion of owners purchased the patented burners for substitution in their old "Toledo" torches.

Not only did the new burner remain lighted under high winds and heavy rains; it also reduced fuel costs more than 50% and practically eliminated wick losses, which were from ¾ inch to 1¼ inches each night with the old type burner. Because of these savings the name "Economy" burner was given to the patented device.

After referring to these savings and the fact that the burner would stay lighted in stormy weather, Judge Manton, in the opinion of the Second Circuit Court of Appeals, stated (N. Y. R. 449):

> "These advantages are obtained by substituting for the burner of the old open-flame torch, which was a wick-tube and wick protruding from the container for oil, a burner in which the end of the wick-tube and wick are enclosed in a metal cap provided with suitable air inlets and flame outlets. The cap is supported on a flange which contacts the wick-tube and transmits heat to the wick-tube and wick to maintain the oil above the flash point and provide under all weather conditions a suitable supply of hydrocarbon vapor which escapes from the flame openings in the metal cap and burns outside the cap. Regardless of the effect of wind

[10] The principal steps in these experiments are illustrated by the cuts on pages 168 to 180 of the Ohio Record and pages 270 to 288 of the New York Record.

> and rain on the flame outside the burner, the source of the flame inside the burner is protected and continues to supply the hydrocarbon vapor necessary to feed the flame which is the warning signal."

Within a few months from the appearance of the "Economy" burner on the market McCloskey Torch Company, which for several years had been selling the McCloskey open-flame torch in competition with the "Toledo" open-flame torch, brought out a burner similar in construction to the patented "Economy" burner, which it called the "Cyclone" burner, and advertised it as a "wonderful improvement."[11] Some time later R. E. Dietz Company, of New York, which was manufacturing an open-flame torch similar to the Toledo when the "Economy" burner was placed on the market, came out with a protected type torch which was charged to infringe the patent in suit and was subsequently licensed thereunder. Dietz gave to this new burner the name "Stormproof," and in its advertising stated (Ohio R. 203):[12]

> "Dietz No. 32 Stormproof Burner has been put to the most rigorous tests without a single failure. It burns in severest wind and rain and is the MOST DEPENDABLE of all types."

In 1933 Anthes Force Oiler Company took a license under the patent in suit at a royalty of 3c per torch or burner.[13] In 1934 similar licenses were taken by K-D Lamp Company, of Cincinnati, and The Doray Lamp Company, of Chicago, which licenses are still in force. Shank

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11 For circulars of the open type and "Cyclone" McCloskey burners see Ohio R. pp. 204-205; N. Y. R. pp. 299-305.

12 For circulars of the Dietz open type and "Stormproof" burners see Ohio R. pp. 199 and 203.

13 This is the company which manufactures the flare involved in the New York case. The flare made under the license is illustrated at page 253 of the New York record. It had air inlet openings in the side of the cap. Later Anthes raised the cap supporting flange slightly above the body of the flare, shifted the air inlet openings from the cap to the supporting flange and refused to pay further royalties. The license was thereupon cancelled and the New York suit resulted.

lin Manufacturing Company, of Chicago, and Embury Manufacturing Company, of Warsaw, New York, are other licensees.[14]

About 1934 the infringing Bolser and Kari-Keen flares appeared on the market. These are the devices involved in cases 166 and 167.[15]

Many states have adopted laws which require trucks and busses parked along the public highways between sundown and sunrise to be marked by flares set alongside and at each end of the vehicle at prescribed distances therefrom. The flares made under the patent in suit and the Bolser, Kari-Keen and Anthes flares pass all these tests and meet all the requirements for making them acceptable for this service, whereas the old type open-flame torches or flares will not pass these tests and are not acceptable for this service.

All of the courts below recognized that the invention of the patent in suit was not anticipated. In the two decisions unfavorable to the patent it was held invalid for want of invention over the prior art—not for anticipation by the prior art. In a well reasoned opinion the District Court for the Northern District of Ohio held the patent valid and that the essence of the invention is the protection of the flame at its source, which leaves the body of the flame unprotected and free to act as a warning signal. The Court of Appeals for the Sixth Circuit treated the patent as merely one for a flame guard

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[14] Circulars illustrating and describing several of the licensed devices are in evidence as Exhibits 20 to 23 in the New York case.

[15] A Kari-Keen circular is found at page 197 and a Bolser circular at page 222 of the Ohio record. The Kari-Keen circular states:

> "The specially constructed burner will continually burn in a 40-mile gale and is not affected by rain or storm. The heat generated in this burner converts the fuel to a gas and only the gas burns. This adds a long life to the wick."

And the Bolser circular states:

> "The greatest advance in flare construction of all time. • • • Approved by Highway Commissions and Insurance Companies all over the United States."

and concluded, in the face of the foregoing facts, that what the patentees did lacked invention, reversing the decree of the District Court. The District Court for the Eastern District of New York, quite properly, deferred to the prior decision of the appellate tribunal. However, the Court of Appeals for the Second Circuit, passing squarely on the question of invention, found that the presumption of validity had not been overcome by the mere argumentative assertion that it required no invention to produce a kerosene burning torch which would accomplish the highly desirable results that were first accomplished by the patentees.

SUMMARY OF ARGUMENT

1. The invention of the patent in suit is not anticipated. Although the device of the patent concededly produces new and highly useful results, no structure disclosed by the prior art is alleged to be capable of operation to produce the same or similar beneficial results, and no combination of old elements can be so operated without using such elements in a manner and for a purpose for which they had never been used prior to the invention of the patent in suit and for which they were not intended to be used.

2. The patent discloses invention. Substantially all the recognized indicia of invention are present to support the presumption of validity raised by the issuance of the patent, *viz.*, prompt acceptance by the public to the substantial exclusion of older devices used for similar purposes; accomplishing the same or better results at substantially reduced cost; acceptance and extensive use in fields not available to older devices; recognition of the patent by a number of manufacturers who have taken

licenses and are actively competing with the patent owners for public favor, and earlier unsuccessful attempts by others to produce a device which would overcome well known objections to the torches in common use. Moreover, the question of validity is not complicated by any claim of unfair use of the patent grant or suppression of the invention to the detriment of the public. On the contrary, the owner of the patent promptly commercialized the device and granted unrestricted licenses at a reasonable royalty to all who wished to operate under the patent.

3. The patent is infringed. The alleged infringing structures—the Bolser, Kari-Keen and Anthes flares—embody the same elements combined in substantially the same way as described and claimed in the patent and operate with substantially the same economy and efficiency to produce the same results as are produced by the "Economy" burner made under the patent by the owner thereof.

ARGUMENT

Point 1. The Invention of the Patent in Suit Is Not Anticipated

Although the device of the patent in suit concededly produces new and highly useful results, no structure disclosed by the prior art is alleged to be capable of operation to produce the same or similar beneficial results, and no combination of old elements can be so operated without using such elements in a manner and for a purpose for which they had never been used prior to the invention of the patent in suit and for which they were not intended to be used.

During the many years that torches have been used

as warning signals for protecting the public from injury or death due to the presence of obstructions or excavations on the public highways, there has been a need for one which would remain lighted in stormy weather. A reliable highway flare is a safety device of growing importance. No more sincere tribute to the success and value of a device of this character can be obtained than that emanating from the infringer. Thus, for example, the circular advertising the Bolser infringing structure states (O. R. p. 222):

> "Genuine Bolser Flares—For Safety.
>
> "This Safety Feature PREVENTS Accidents.
>
> "Liability insurance can rebuild a crashed car—pay a hospital bill—compensate for lost time, but it can't return the dead to life, or repair shocked and shattered nerves.
>
> "Protect yourself against the grief and pain of hurting others. Do your part to prevent the thousands of motor car accidents that occur every year because of stalled trucks, busses and cars being struck by speeding cars. Hundreds of thousands of others are barely avoided. Thousands of lives are lost—more thousands of people injured—millions of dollars worth of property damaged.
>
> "Your own good judgment says 'Use Flares.' Comparison and common sense say Use the Best Flares—the Genuine Bolser Flares—road tested and time tried.
>
> "Bolser Flares are your safety insurance. They are always ready for use—quickly set out or picked up—and more efficient than the law requires."

At a time when hundreds of thousands of persons are being killed and maimed on the public highways each year it would seem that a patent for a safety device which has been widely recognized as more reliable and efficient than any before known should not be lightly set aside on

the mere assumption that the thing should have been obvious to anyone who would take the trouble to look at the prior art. Yet that was the erroneous holding of the Court of Appeals for the Sixth Circuit. On the other hand, the Second Circuit Court of Appeals avoided this error.

Thus, as would be expected, there is a sharp conflict between these two Courts of Appeals as to what the prior art disclosed to one skilled in the art. In the Sixth Circuit decision, Judge Simons treated the patent as one for a flame guard and nothing more. He stated (Ohio R. 285; 93 Fed. (2d) 337):

> "Stripped of variations in nomenclature, and the ingeniously differentiated phrases of counsel in setting forth the claims, the invention is for a burner with a metal guard to protect the flame from air currents and rain. The art is full of illustration and description of metal guards for burners, typical of which are the patents to Almond, No. 193,796; Blake, No. 453,335; Kahn, No. 1,755,527; Heston, No. 270,587, and Hathaway, No. 147,496. • • • There is here no substantial evidence of effort general to the industry to solve a problem which long defied it. The proof is limited to experiments of the patentees, and so far as it goes it serves to demonstrate lack of awareness of the teachings of the art rather than the inherent difficulties of the problem itself. They chose the long road to solution, and the patent law does not reward mere persistence, unassociated with original creative effort."

In the Second Circuit decision, in which the prior art relied on was substantially the same as in the Sixth Circuit, Judge Manton, holding the patent valid, stated (N. Y. R. 451; 99 Fed. (2d) 808):

> "The prior art does not disclose or suggest the combination or result here obtained. The patent

to Rutz No. 1,101,146, granted June 23, 1914, had for its object

'to provide a simple, economical and effective flash igniter for a series of gas stove burners, the same being grouped about the igniter and within the field of entrained jets of flame, which jets are emitted from the igniter under the control of the operator.'

"This device was used on a kitchen gas range and many of them were sold. The flame they are designed to protect is a small pilot light, which burns continuously and is so feeble that it might be extinguished by indoor drafts, such as the sudden closing of a door. The flame is completely enclosed within the metal cap. The principal function of this cap is materially different from any function of a burner of the patent in suit. The fuel is not the same. Rutz uses gas under pressure. The patentee here uses kerosene which must be vaporized before it will burn and when vaporized is not under pressure. There is the problem of heating the fuel to vaporize it. Rutz makes provision for cooling the cap by providing a substantial space between the pilot light and the cap walls, also by passing a cylinder of air up through the vent openings in the supporting disk and out through vent openings near the top of the cap, whereas in the patent in suit the heat of the cap is utilized to assist in heating the kerosene in the wick above the flash point. In the Rutz patent there is no means for heating the cap if its use there were desirable. The pilot light is small and so far spaced from the cap that no substantial amount of heat will be transmitted to the cap, even in the absence of the rising cylinder of air inside the cap and along its walls. The flame which follows the jets of gas to the stove burners continues for only a fraction of a second and does not impinge upon the walls of the cap.

"Heating the cap is very important in the patent in suit, one of its functions being to supply heat to the wick and the oil in the wick tube so as to raise the oil above the flash point. In the Rutz patent

there was no problem of fuel or wick consumption, whereas these were important considerations of the patent in suit. Rutz had no problem of maintaining the flame under conditions of wind and rain."

The Rutz specification refers to the desirability of preventing the cap or hood from becoming heated, as follows (N. Y. R. 380, lines 51-57):

> "It is also essential to perfect combustion that the torch head tip 9', which burns a constant pilot-flame, should be spaced at a distance equal in all directions from the walls and dome of the hood to prevent generation of foul gases through the heating of said hood."

On the same page, at lines 96-106, the patent refers to the current of air which passes upwardly through the cap, stating:

> "In order to insure more perfect combustion I provide the hood dome with a series of auxiliary vents 13 that encircle said dome above the firing ports and hence air to supply oxygen to the flame will be more readily drawn up through the bottom of the hood and caused to pass in vertical stratas about the pilot-light and from thence through the firing ports and vents to effectually check cross currents of air while the small pilot-light is burning."

The Rutz cap was not designed for the same purpose as Withrow and Close's, no person looking at it or using it would understand that it was to be used in the way Withrow and Close's cap is used, and it is not shown to have been really used and operated in that way at any time prior to the date of the Withrow and Close invention.[16] In an effort to show how the Rutz cap could be used to produce results similar to those of the patented

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[16] Paraphrasing the language of the court in *Clough vs. Barker*, 106 U. S. 166, 176.

device, defendant in the New York case found a Rutz cap which would fit upon one of the Anthes flare bodies, and that combination was offered as Defendant's Exhibit L. This is a pure case of after-the-fact wisdom. Furthermore, there is no proof as to when this particular Rutz cap was made, but we know that the Anthes body was not made prior to 1933, because Anthes first made these flares during that year as a licensee under the patent in suit.

Referring to the new function this Rutz cap would thus be called upon to perform, defendant's expert stated, "you lift it from one purpose to another."[17] This statement was made in answer to a question by the court during the redirect examination. Following it the witness testified (N. Y. R. 127):

> "RDQ. 339. In transferring the Rutz hood to a torch body do you make any change in its function or operation? A. All the principles of operation remain the same.
>
> "RXQ. 340. Do you mean just that? There is a difference in the function, is there not? A. The principlez remain the same.
>
> "RXQ. 341. **The function is different, isn't it?** A. **Oh, yes, sir.**" (Emphasis ours.)

This same witness testified that he was familiar with the Rutz cap from having one on his stove, and that before he was shown Exhibit L he had seen plaintiff's and defendant's devices and knew what they were used for and that they would withstand wind velocities as high as 40 miles per hour.[18] Yet he was surprised to find that he could not blow out the flame of the Exhibit L combination, consisting of a Rutz cap on an Anthes body.[19] Al-

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[17] N. Y. R. 127, f. 379.
[18] N. Y. R. 106, XQ. 236-239; 107 XQ. 247.
[19] N. Y. R. 89, Q. 114.

though he had one of these caps on his gas range he had never associated it with wind. He testified (N. Y. R. 107):

> "XQ. 248. And it never occurred to you, with your familiarity with those caps for years, that a thing like that could withstand the wind that it did? A. I never tried it in a wind. I know it always stood up on our gas range. I never associated it with wind."

Plaintiff's expert, Dr. Olsen, is in entire accord with Dr. Luckiesh in this regard. He testified (N. Y. R. 204):

> "Q. 35. Will you please give us your opinion as to whether or not with full knowledge of the Rutz patent and its disclosure, would it give any helpful information to one seeking to produce an open air enclosed flame torch that would withstand wind velocities of gale proportions? A. No, I can't see that it would."

The other reference mainly relied on in the Second Circuit case was the Russian patent to Malcov, concerning which Judge Manton stated (N. Y. R. 452; 99 Fed. (2d) 809):

> "The Russian patent to Malcov, No. 1163 of 1868, is for a lamp burner of special construction. The description is meager and the drawing vague and it is justly so criticized. The specifications refer to two tubes and state that between them 'there remains a space into which may enter a third tube called regulator and intended for the adjusting of the size of the flame.' Apparently it was intended to use charcoal which would become heated above the flash point of the oil and hydrocarbon vapors (and) would escape through the small perforations in the dome, where they would mix with the air and burn. The experts called were unable to understand the disclosure of this Russian patent. It does not anticipate the patent in suit."

Defendant in the New York case made up a device (Defendant's Exhibit I) which was offered as illustra-

tive of the Malcov disclosure, and a drawing of this made-up device was offered as part of Exhibit B.[20] Concerning this Malcov figure on Exhibit E, defendants' expert, Dr. Luckiesh, testified (N. Y. R. 102, 103):

> "XQ. 206. Well, see if I understand what you mean. In the drawing, Defendant's Exhibit B, which purports to represent it—you mean there is a tube inside the tube A of that drawing? A. Inside the tube A—yes, that is my recollection. That is the best we could get out of our combined ideas of what the patent meant.
>
> "XQ. 207. There is quite a little dispute between you as to what the Russian patent did mean? A. As we said before, it is rather an incomplete sort of a statement.
>
> "XQ. 208. You had to do a lot of arguing back and forth and a lot of conjecture? A. Well, we had to discuss it.
>
> "XQ. 209. I presume all of you had different ideas about it? A. I don't think so, eventually.
>
> • • • • •
>
> "XQ. 213. So that that inner tube is not shown in that drawing? A. Either the inner or the outer, but it must be the inner, because of this (indicating)."

There are really three tubes called for by the patent. The specification refers to two tubes *a* and *b*, and states that between them "there remains a space into which may enter a third tube called regulator and intended for the adjusting of the size of the flame."

Plaintiff's expert, Dr. Olsen, also had difficulty in understanding the disclosure of this Russian patent. He testified (N. Y. R. 205, 206, 228):

> "Q. 41. All right, let us take up this Russian patent, Fig. 4 of Defendant's Exhibit B. Do you agree with Dr. Luckiesh—
>
> The Court:
>
> That is the Malcov patent?

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[20] N. Y. R. 321.

Mr. Darby:

Yes, the Malcov patent, Fig. 4, Exhibit B.

"Q. 41 (continuing): Do you agree with Dr. Luckiesh that the disclosure of this patent is ambiguous and vague? A. Oh, yes, I spent a lot of time on that trying to figure it out.

"Q. 42. Have you yet figured out what the structure was? A. I am not certain we have got it figured out, but I think this is probably a close approximation to it. Whether it is right or not, whether there are four members supporting this or two, is a question. It seems to me there are only two, and I think in the model he has got four. I think his description indicates only two. Other than that he did have a perforated top and a couple of wings, shown here. (Indicating.)

"Q. 43. And when you refer to the model, you mean Defendant's Exhibit I? A. Yes.

* * * * *

"XQ. 218. The entire portion in which the dots are shown in this structure is a solid piece of metal except for these minute openings? A. Well, of course, you have drawn it here according to your conception of this thing, but if I should draw it according to my conception I would put the wings on each side and I would extend those across and make the top.

"XQ. 219. You would put a dome across the top? A. Yes, with these two wings.

"XQ. 220. And on the side there would be— A. Metal.

"XQ. 221. Metal? A. Yes, sir, on two sides. That is just a matter of speculation, because it is not very clear."

Besides omitting two of the three tubes, the so-called model of this Russian patent omits any representation of the following portion of the construction called for by the patent (N. Y. R. 327, f. 980):

"* * * In order to protect the top portion of the wick from deterioration, the upper portion of the burner directly above the wick is packed with

asbestos, crushed charcoal or some other incombustible material readily conducting liquid; in this connection care is to be taken that no more than ¼ inch of free space is left to the upper exterior end of the burner."

From this it will be seen that the Second Circuit Court of Appeals was quite correct in holding that the prior art would not have taught or even suggested the invention of the patent, and that what is disclosed and claimed thereby required inventive ingenuity of a high order.

Of the patents referred to by Judge Simons, Kahn[21] was for a hood for flash igniter, similar to that of Rutz, and the remarks of Judge Manton are applicable. The others are less pertinent.

Almond, 193,796 of 1877,[22] was for a heater, not a signal device. Defendant's expert in the Ohio cases said that he had not built a model of Almond because he "did not want a heating burner." Almond's asserted purpose was to "produce a perfect heating flame, useful for many purposes in the arts."[23] He surrounded his burner with a perforated sheet metal shield G, entirely open at the top. At its lower end this shield was secured to a "wooden or other bad heat-conducting base-block E, * * * to keep the flame above from unduly heating the reservoir." And to still further prevent transfer of heat to the wick tube or reservoir he proposed to cover the wooden block E and the tube D (which encloses the wick tube) "with asbestos-paper or other non-combustible substance."[24] Thus, Almond intentionally guarded against heating the wick and the fuel contained therein, which is

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21 Ohio R. 260.
22 Ohio R. 241.
23 Ohio R. 243, first column, lines 10-11.
24 Ohio R. 242, col. 1, lines 8 to 15 from bottom.

one of the important features of the burner of the patent in suit, essential to its successful operation.

Dr. Olsen conducted a series of tests of the Economy and Anthes flares during which he took the temperatures of the caps and of the fuel in the wick tubes. He found the cap temperatures to run as high as 718° F. and that the heat from the cap was conducted "into the flange and into the tube surrounding the wick, and this heat would supplement the heat from the small flame in the combustion zone, and would succeed in maintaining the temperature of the wick tube and the kerosene which would be vaporized and keep that flame going."[35] After burning the devices for five or ten minutes, he thrust the bulb of a thermometer up into the fiber of the wick in the wick tube and found the temperature to be between 153° and 210° F., "and this temperature was reached even in a forty-mile wind. In other words, high wind velocity did not seem to succeed in eliminating this little flame, or cooling the kerosene, whether it be the Anthes or the Toledo; they both acted alike in that respect, they both gave us this high temperature of feed." Kerosene gives off no combustible vapors at ordinary temperatures, but must be heated to the flash point, which runs up to 150° or 160° F.[36]

Both Withrow and Close testified that a burner made in accordance with the Almond patent would not stay lighted in a moderate wind with the shield G in place and that it would be less reliable with the shield removed, as respondents in the Ohio cases proposed to do in order to make it a reference against the patent in suit. There is no evidence to the contrary.[37]

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[35] N. Y. R. 197, f. 591; 217, f. 649.
[36] N. Y. R. 196, f. 587; 197, f. 589.
[37] Ohio R. 133, top; 137, bottom.

Heston 270,587 of 1883[28] was for a vapor burner. The part which might perhaps be superficially thought of as a shield or guard, served no such function. It comprised two caps B and C, one over and adapted to revolve upon the other. There were holes in each, and by the revolution of the outer upon the inner, the registration between the holes might be regulated, thereby determining the size of the issuing gas jets. Neither in construction nor function do these caps suggest the shield of the patent in suit. The vapor was generated in the chamber M' at the left of Figure 1, from whence it passed downwardly through vapor pipe Q and branch pipe V and thence upwardly in a jet through pipe R to chamber A, "from which chamber it issues through the perforations and openings before set forth."[29] There was no wick or wick tube and the burner was intended for heating.

Hathaway 147,496 of 1874[30] was for a lamp burner which produced a flame from minute horizontal radiating jets of vapor. The cap or cover seems not even remotely to suggest the patentees' cap. The lamp was of course not designed to be used in the wind. The cap had lips extending horizontally outward near the gas jets and so gave some measure of protection from slight drafts, but did not suggest the patentees' device either in form or function.

Blake 452,335 of 1891[31] was for a burner intended for use with "the lighter and more volatile oils—such as naphtha or gasoline—which vaporize at moderate heat." The cap was similar in construction and function to those of the flash igniter patents of Rutz and Kahn. It had air inlets c' at the bottom and openings c^2 in the sides,

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[28] Ohio R. 244.
[29] Ohio R. 246, lines 67, 68.
[30] Ohio R. 233.
[31] Ohio R. 247.

which registered with jet openings b^3 in the vaporizing chamber B^3. Minute jets of vapor were shot horizontally out through the registering openings in the outside wall of the chamber. The device might be operated with a previously formed gas as well as by vaporizing naphtha or gasoline. It was not intended that the jets of flame would unite in one large flame, the patent stating that the "devices employed are designed also to make the maximum flame consist of radiating jets rather than a continuous integral flame."[32] There was no wick; on the contrary, the supply tube A was filled with an absorbent or porous substance A^1, to check the flow of the fluid to the burner, which indicates that the fuel was under pressure.

There is no proof in the Ohio record that any of these prior art structures was ever made or used. In the New York case it was proven that the Kahn and Rutz flash igniters have been used, the latter to the extent of 15,000,000. All the others are "paper patents."

The problem which confronted Withrow and Close was quite different from any to which these prior patents were directed. The luminescent flame of the old style open torch burner, resulting from imperfect combustion, provided an ideal warning signal so long as it stayed lighted. The proofs show that with the wick extended an inch and a half it would sometimes remain lighted in a wind up to about twenty-five miles an hour if unaccompanied by rain. The wick was soaked with kerosene and burned from the sides as well as the top. Defendant's expert in the New York case aptly referred to it as "a bonfire of cotton fibre." High fuel and wick consumption were natural consequences. As much as 1¼ inches

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[32] Ohio R. 248, lines 30-33.

of wick was consumed in one night. A strong cold wind would blow the flame away from the wick and cool the oil below the flash point, thus causing the flame to go out. If water soaked the wick, it would vaporize and cool the wick down below the flash point, and the flame would go out.

The flame produced by these open-flame torches was 3 or 4 inches in diameter, 6 to 8 inches high, of irregular shape, flickering and weaving from side to side with changing air currents. Its very instability made it a better warning signal on the public highways than the colored lantern with its small, steady, protected flame. This was especially true after the advent of the automobile, when a red lantern could not be distinguished from a tail light.

Mr. Close, one of the joint inventors, has manufactured torches and flares continuously since 1925, has made nearly a million of them, has witnessed thousands of operations of them in the open air and has "never seen any conditions when the flame was not moving when the torch was placed outdoors." This applies to both the old open-flame and the patented torches.[33]

For these reasons the open torch flame made an ideal warning signal, if only it could be made to stay lighted. The problem was not to enclose the flame, as the Ohio court assumed. Even could that be done with a flame of this size, its utility as a warning signal would be destroyed. On the contrary, the problem was to preserve this open, unsteady flame and to maintain it under all kinds of weather conditions, without enclosing it.

The prior patents relied on afford no suggestion as to how this problem could be solved. In none of them

[33] N. Y. R. 183, f. 549; 190, f. 568.

is there a small flame burning from a wick inside a protected chamber, with utilization of heat from this small flame and from the chamber walls to raise the temperature of the fuel in the wick above the flash point, thus providing a supply of vapor for a flame to be burned partially inside on the wick but mainly outside the chamber.

When Dr. Olsen was told that the Economy and Anthes flares would withstand a 40-mile gale, he was surprised and wished to learn why this was so when ordinary flames blow out so easily. He thereupon purchased three each of the Economy and Anthes flares and subjected them to various tests. His explanation for the unexpected results may be summarized as follows:

1. The three fuels—gas, gasoline and kerosene—are very different from the standpoint of the burner. They burn only in gaseous form. Fuel gas is already completely in a gaseous form at all normal temperatures. Gasoline readily volatilizes and produces combustible vapors down to zero Fahrenheit. Kerosene gives off no combustible vapors at ordinary temperatures, but must be heated to the flash point, which runs up to 150° or 160° Fahrenheit.[34]

2. He found a small protected combustion chamber in the bottom of the cap in both devices, provided with restricted air inlets, "so that when you once light it you have a little chamber where a little air is admitted, and which maintains the temperature of the wick to the point where it will give off vapor."[35]

3. He found the cap temperature to run as high as 718° F., and that the heat from the cap was conducted "into the flange and into the tube surrounding the wick,

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[34] N. Y. R. 195, f. 584; 195, f. 587.
[35] N. Y. R. 196, f. 588.

and this heat would supplement the heat from the small flame in the combustion zone, and would succeed in maintaining the temperature of the wick tube and the kerosene which would be vaporized and keep that flame going."[36]

4. After burning the devices for five or ten minutes, he thrust the bulb of a thermometer up into the fiber of the wick in the wick tube and found the temperature to be between 153° and 210° F., "and this temperature was reached even in a forty-mile wind. In other words, high wind velocity did not seem to succeed in eliminating this little flame, or cooling the kerosene, whether it be the Anthes or the Toledo (Economy); they both acted alike in that respect, they both gave us this high temperature of feed."[37]

To summarize Dr. Olsen's findings, there is a small protected zone or chamber below the flame exit openings in these devices into which chamber a little air is admitted. When the wick is lighted a small portion of the flame burns in this protected chamber, and this flame assists in maintaining the temperature of the wick above the flash point. When the cap becomes heated the heat from the cap is transmitted to the wick tube and wick through the flange which supports the cap, thus supplementing the heat from the small flame in the protected chamber in maintaining the kerosene in the wick above the flash point and insuring a constant supply of hydrocarbon vapor for the torch flame outside the cap.

Dr. Olsen concluded his testimony in this connection by saying (N. Y. R. 197, f. 591):

> "And when I reached that conclusion after these experiments, I thought I understood how this device operated."

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[36] N. Y. R. 197, f. 591; 217, f. 649.
[37] N. Y. R. 197, f. 589.

After subjecting three each of plaintiff's and defendant's flares to various tests, Dr. Olsen said: "I could get just as big a variation between three different samples of the Anthes flare and from three different samples of the Toledo flare as I could between any two of them." He further said (N. Y. R. 198, f. 594):

> "And when I got through and averaged up, they were just about as alike as two twins, or two peas in a pod. There were little differences, but I thought they were insignificant."

The accomplishment of the patentees Withrow and Close strikingly appears from the fact that the patented burner withstands all the severe tests to which truck flares are subjected by State Highway Departments before they will be approved. The earliest and at the present time one of the milder series of tests are those for the State of Iowa. These are set forth in a letter from the Iowa State Highway Commission and include wind tests, combined wind and rain tests, a carbon deposition test and a length of burning time test.[38]

The wind tests require that a flare remain lighted for at least 30 seconds in a 40 m.p.h. wind and that it shall burn continuously in a 26 m.p.h. wind. The combined wind and rain tests require that the flare shall burn for at least 5 minutes in a 26 m.p.h. wind with rain applied at the rate of 2.48 inches per hour. The carbon deposition test requires that the carbon deposition be light and the flare remain in such condition that it will pass the two preceding tests. The time test requires that the flare shall burn for at least eight hours.

The tests for Pennsylvania and a number of other states are more severe. The Electrical Testing Labora-

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[38] Ohio R. 210; N. Y. R. 314.

tories of New York conducts the tests for Pennsylvania. They include a weatherproof test in which the lighted flares are subjected to a spray of water at 1/10th of an inch a minute (6 inches an hour) for 15 minutes, then 3/100ths of an inch a minute (1.8 inches an hour) for 30 minutes, and finally 1/100th of an inch a minute (.6 inch an hour) for 45 minutes, during which time the flare is rotated at the rate of 4 revolutions a minute, the water being applied on top of the flare through a standard spray at an angle of 60°; a visibility test which requires that the flame be visible at a distance of 500 feet at both 5 m.p.h. and 40 m.p.h. wind velocity, and a reliability and light test which requires that a flame withstand a 40 m.p.h. wind for 15 minutes while being rotated at the rate of 4 revolutions a minute, followed by a 5 m.p.h. wind for 11 hours and 45 minutes, or a total of 12 hours continuous burning time.[39]

Plaintiff's flare and all three of the infringing flares involved herein withstand these or similar tests, whereas the old open-flame flares will not withstand even the milder Iowa tests.[40]

In brief summation of this point, the fact that the patented flare or torch was new, extremely useful, reduced operating costs by half, and supplied an extensive demand of many years standing is not disputed. We therefore next take up a consideration of whether or not inventive ingenuity was required to produce that device.

Point 2. The Patent Discloses Invention

Substantially all the recognized indicia of invention are present to support the presumption of validity raised

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[39] N. Y. R. 42, 43.
[40] Ohio R. 211; N. Y. R. 315.

by the issuance of the patent, *viz.*, prompt acceptance by the public to the substantial exclusion of older devices used for similar purposes; accomplishing the same or better results at substantially reduced cost; acceptance and extensive use in fields not available to older devices; recognition of the patent by a number of manufacturers who have taken licenses and are actively competing with the patent owners for public favor, and earlier unsuccessful attempts by others to produce a device which would overcome well-known objections to the torches in common use.

(a) Prompt Acceptance by the Public to the Substantial Exclusion of Older Devices Used for Similar Purposes.

During the years 1926 to 1928, inclusive, The Toledo Pressed Steel Company sold a total of 66,751 Toledo open-flame torches. The Toledo Economy burner and torch were placed on the market late in January of 1929 and during the remainder of that year 46,624 of these complete torches and 18,359 separate burners were sold. The separate Economy burners were sold to owners of the old Toledo torches, being so constructed that they could be substituted for the burners with which those torches were originally equipped. During the succeeding five depression years, when its business in other lines had practically stopped, the Toledo Company sold nearly 300,000 of its Economy torches and flares and over 17,000 separate Economy burners, and during the years 1935, 1936 and 1937 more than 450,000 Economy torches and flares were sold. For a year or eighteen months after the

Economy torch was placed on the market there were a few sales of the old Toledo open-flame torches and then they stopped entirely.[41]

(b) The Patented Torch Accomplishes Better Results Than Those of Its Predecessor—the Open-Flame Torch—at Less Than One-Half the Cost

The results obtained from torches and flares embodying the invention of the patent in suit are better than those obtainable from the old open-flame torch because of the greater reliability of the patented devices in stormy weather, and the cost of operation has been reduced more than 50% in fuel consumed and practically 100% in the amount of wick consumed. The manufacturers recommended 1½ inch or more wick exposure for the old torch and recommend ⅛-inch wick exposure for the patented torch.[42]

(c) The Toledo Economy Flares Are Accepted and Extensively Used in a Field Not Open to Any Torch or Flare of the Prior Art.

The open-flame Toledo torch was not acceptable for use as a warning signal for parked trucks and busses because of its unreliability; nor were red lanterns, because of their resemblance to automobile tail lights. In October, 1929, the Toledo Company received a letter from the Michigan Public Utilities Commission that their Economy torch passed the requirements made by that commission "regarding all common carriers carrying two

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[41] N. Y. R. 25, 26, 28.
[42] Ohio R. 167, 182, 185-191, N. Y. R. 21, f. 63, 239, 307-309

oil burning torches."[43] We have already pointed out that petitioners' and respondents' flares all pass the state tests and that the old open-flame type do not.

(d) The Patent in Suit Has Been Recognized by a Number of Manufacturers Who Have Taken Licenses.

As previously stated, Anthes Force Oiler Company, manufacturer of the flare held to infringe in the New York case, took a license under the patent in 1933. Under that license it manufactured and sold the flare illustrated at page 253 of the New York record. Later it changed the construction slightly and refused to pay royalties on the ground that the patent does not cover the changed structure, whereupon its license was terminated. In 1934 K. D. Lamp Company, of Cincinnati, and Doray Lamp Company, of Chicago, took licenses. Subsequently, R. E. Dietz Company, of New York City; Shanklin Manufacturing Company, of Chicago, and Embury Manufacturing

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[43] Ohio R. 68, 69, 184. To take care of this truck business the Toledo company brought out the flare illustrated in the circular at page 258 of the New York record and by Exhibit 19 in that case. An Economy torch is in evidence as Exhibit 17 in the same case and is illustrated in the circular at pages 181, 181a of the Ohio record. These torches and flares pass the most severe tests prescribed by any of the states. A typical state law is that of Iowa, which provides (Ohio R. 80):

> "Section 1. Motor trucks and combinations thereof operating on the highways during the period from one half (½) hour after sunset to one-half (½) hour before sunrise shall at all times be equipped with portable flares which may be plainly visible for a distance of five hundred (500) feet. The operator of a motor truck or combination shall, immediately upon bringing his vehicle to a stop upon or immediately adjacent to the traveled portion of the highway at any time during the period from one-half (½) hour after sunset to one-half (½) hour before sunrise, place a flare at the side of such vehicle and in plain view of all traffic, and shall maintain it in such position during the time such vehicle remains parked."

One of the rules adopted by the Iowa Public Utilities Commission under this law reads (Ohio R. 80):

> "Place lighted pot torches 100 full steps ahead and behind the vehicle at least one full step out in the road, and a lighted pot torch along the side of the vehicle which others pass. In the daytime use flags instead of pot torches, except at side of vehicle."

Company, of Warsaw, New York, have taken licenses.[44] Circulars illustrating several of these licensed structures, which are being sold in active competition with the Toledo Economy torches and flares, are in evidence in the New York case as Physical Exhibits 20 to 23.

(e) Others Attempted to Overcome the Objections to the Open-Flame Torch, But Without Success.

1. In 1913 the Detroit United Railways adopted a heavy cast iron open-flame torch for use in connection with its street railways. Prior to that time they had used only red lanterns. One of these torches is shown at A in the photograph at page 261 of the New York record. It was provided with three separate wick tubes and wicks, the idea being that if one of the wicks remained lighted during wind or rain it would relight the others. It was found that all three flames would be extinguished by heavy rain and wind, and about 1920 an effort was made to improve this condition by placing a flat metal disk or umbrella over and a short distance above the ends of the wicks.[45] Concerning their use, Mr. Kerwin, Superintendent of Way and Structures Department of Street Railways, City of Detroit, which has owned and operated the street railway system since about 1922, testified (N. Y. R. 60, f. 178):

> "To the best of my recollection, we experimented with this umbrella over the three wicks for a period of a couple of years and then discarded it as giving just as much trouble and having just as many flames go out as if we hadn't carried it at all. It did not remedy the defect that we were

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[44] N. Y. R. 27, 29.

[45] This is shown in the blue print Exhibit 9, the pertinent figure of which is reproduced at the end of this brief.

trying to overcome. We have trouble today from these torches being blown out or rained out. For the protection of the public under those conditions, all excavations are protected at night time, in addition to the mechanical protection of torches, by watchman. He has many duties, takes care of the tools, watches them that nobody steals them, and makes the rounds regularly to see that the torches are burning, and if they are extinguished by rain or high wind, it is his duty to relight the torches."

Thus it will be seen that, although the Detroit United Railways had every incentive to produce a flare or torch possessed of the qualities of the one of the patent, and endeavored to do so, it failed utterly. After two years' experimentation it went back to the old unprotected torch, which it could use with reasonable safety by utilizing a watchman as an attendant therefor, thus making the best of an undesirable situation.

2. R. E. Dietz Company, of New York, is the oldest and largest manufacturer of lamps and signal lamps in this country. Early in 1928 it decided to add a torch to its line of signal devices and secured one of the Toledo open-flame torches for experimental purposes. The designing of the new torch was in charge of Mr. Currie, who had been with Dietz for twenty-five years and was Works Manager of the Dietz factories, in charge of all production. The Toledo torch was sent to him at Syracuse, where the principal Dietz factory is located, to experiment with.[46] He found that this old Toledo torch used a great deal of oil, that it was not weatherproof, particularly in rain, and would not stand up against wind unless the wick was raised considerably above the burner. At ½-inch extension he said it would withstand about 35

[46] N. Y. R. 167, f. 500.

miles an hour, and with 2-inch extension it would withstand a 40 mile an hour wind, without rain.[47]

Mr. Currie spent a great deal of time in an unsuccessful endeavor to produce a torch which would overcome the defects of this open-flame Toledo torch. His efforts were continuous and extensive throughout the better part of the year 1928. Incidentally, this was contemporaneous with the experiments of the patentees, illustrated at pages 270 to 287 of the New York record, which resulted in the production of the torch of the patent in suit.[48]

The experience and knowledge Mr. Currie brought to this work are of great importance on the question under consideration. His inventive ability is well illustrated by the fact that he has taken out fourteen patents and has three pending applications. Since prior to 1928 it has been the practice of his company to keep a current up-to-date file of patents pertaining to the art in which it is interested. He went through this file and considered these patents before starting his experimental work. It included copies of the Rutz and Maleov patents selected by defendant's counsel in the New York case as the best references.[49]

For six years prior to 1928 Mr. Currie had been familiar with the Rutz flash igniter made in accordance with Rutz patent No. 1,101,146. The gas range in his home was equipped with one of these Rutz igniters, with

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47 N. Y. R. 168, f. 504. These figures are higher than other tests have shown. Exhibit 30 (N. Y. R. 311, f. 933) gives the results of wind velocity tests conducted with the four torches shown in Exhibit A reproduced at page 261 of the New York Record. The torch marked B is like the one tested by Mr. Currie. With the wick extended 1¼ inches this torch was extinguished in 15 seconds at a wind velocity of 26.9 m.p.h. and in 2½ minutes at a wind velocity of 28.7 m.p.h. It remained lighted for the full test period of 15 minutes at a wind velocity of 25.1 m.p.h.

48 N. Y. R. 168, f. 503; 169, f. 505.

49 N. Y. R. 176, f. 526; 178, f. 534.

which he was personally familiar, having had occasion to take it apart and clean it.[50]

With this background of experience and information Mr. Currie started in to develop a torch which would overcome the objections to the old open-flame Toledo torch and which his company could market in competition with that torch. Notwithstanding his knowledge of the best prior patented art and his intimate familiarity with the Rutz flash igniter, and the fact that he was not merely a skilled mechanic but an inventor in this line of industry, Currie proceeded by the cut and try process of constructing and testing out burners in the open air, precisely as did the patentees Withrow and Close, and instead of taking the short cut assumed by Judge Simons to have been possible by one who was not handicapped by "lack of awareness of the teachings of the art" he failed entirely in arriving at a solution.

It was no doubt because the patentees and Currie understood and appreciated "the inherent difficulties of the problem itself" that they proceeded as they did. That problem, as we have stated, was to keep the wind and rain away from the source of the flame to an extent sufficient to preserve the flame under all kinds of severe weather conditions and still let the flame out in sufficient volume and suitable quality to act as a warning signal. Judge Hahn aptly referred to the invention as for the "protection of the flame at the source," and we have the apparent inconsistency of a burner which will withstand gales and torrential rains and yet can be blown out by the breath if directed through one of the flame openings in a diagonally downward direction onto the wick.[51]

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[50] N. Y. R. 169, f. 506; 175, f. 525.
[51] N. Y. R. 179, f. 537.

Regarding Currie's experiments he testified that he designed and constructed a number of burners which he subjected to outdoor tests, both around the factory and at his cottage at a lake near Syracuse. These experiments were carried on practically daily.[52] He produced two of the experimental devices made and tested in 1928 which he was able to locate readily, and these are in evidence as Exhibits 37 and 39. Exhibit 37 would stand up against wind but not against rain. None of the devices he tried was sufficiently successful to cause its adoption as a commercial product and following these experiments his company came out in the fall of 1928 with an open-flame torch which was substantially identical with plaintiff's open-flame torch which Currie had been trying to improve. His experiments during 1928 did not produce a torch which he regarded as better than the old open-flame torch which he ultimately resorted to, and in which the wick was exposed about an inch and a half.[53]

Plaintiff's patented torch was placed on the market in January, 1929, after Dietz had brought out its open-flame torch, and Currie heard of it during that month. One of them was sent up to him from the Dietz New York office late in February of 1929 and he found that it solved the problem he and his associates had been unable to solve. He testified that it "became evident immediately that if we desired to remain in the competing field we would have to have something as good," and they worked from February to November before they completed the Exhibit 41 burner which they later placed on the market.[54]

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[52] N. Y. R. 169, f. 505; 173, f. 519; 175, f. 524.

[53] N. Y. R. 171, f. 512, 513.

[54] N. Y. R. 172, f. 515.

After Dietz Company placed this new burner on the market, it was notified of infringement of the patent in suit and took a license. One of the provisions of the license agreement is that the licensee shall make available to the licensor any facts which may be of value to it in connection with the patent. The facts to which Mr. Currie testified were first disclosed to plaintiff on or about February 9, 1938.[55]

One of the protected experimental burners produced and tested by Mr. Currie during these 1929 experiments is in evidence as Plaintiff's Exhibit 38. It would blow out and also went out in a heavy rain.[56]

3. Supplementing this Dietz experience as proving that the solution of this problem was not obvious is the fact that McCloskey Torch Company, of Toledo, a bitter competitor of plaintiff located in the same city and selling to the same trade, continued to manufacture and sell the McCloskey open-flame torch from 1925 until a few months after the patented Economy torch was placed on the market, when it came out with a torch almost identical in construction with the Economy torch, to which it gave the name "Cyclone" and advertised it as a "wonderful improver nt."[57]

This court frequently has stated that invention is a question of fact. If the rule stated in *Radio Corporation of America vs. Radio Engineering Laboratories, Inc.*, 293

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[55] N. Y. R. 173, f. 517; 178, f. 534.

[56] N. Y. R. 171, f. 512; 176, f. 527.

[57] N. Y. R. 303, 305. The earlier McCloskey torch is shown at pages 299 and 301 of the New York Record.

U. S. 1,[55] that one otherwise an infringer **bears a heavy burden of persuasion** and must fail "unless his evidence has more than a dubious preponderance," is applied to the facts of record in these cases, the decrees of the Sixth Circuit Court of Appeals should be reversed and that of the Second Circuit Court of Appeals affirmed. In neither record is there even a "dubious preponderance" of evidence to establish invalidity for lack of invention.

Moreover, the question of validity is not complicated by any question of unfair use of the patent grant or suppression of the invention to the detriment of the public. On the contrary, the owner of the patent promptly commercialized the device and granted unrestricted licenses at a reasonable royalty to all who wished to operate under the patent.

The records in these cases present a question of patent validity, pure and simple, not complicated by any question of public interest, suppression of competition or misuse or abuse of the patent monopoly. Plaintiff in these cases is a small company located in Toledo, Ohio. When complaints came in regarding the reliability of its principal product (the open flame Toledo torch), it had

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[55] In an opinion by Mr. Justice Cardozo, the court said (pp. 2 and 7):

"• • • Even for the purpose of a controversy with strangers there is a presumption of validity, a presumption not to be overthrown except by clear and cogent evidence. • • • A patent regularly issued, • • • is presumed to be valid until the presumption has been overcome by convincing evidence of error. The force of that presumption has found varying expression in this and other courts. Sometimes it is said that in a suit for infringement, when the defense is a prior invention, 'the burden of proof to make good this defense' is 'upon the party setting it up,' and 'every reasonable doubt should be resolved against him.' • • • Through all the verbal variances, however, there runs this common core of thought and truth that *one otherwise an infringer* who assails the validity of a patent fair upon its face *bears a heavy burden of persuasion*, and fails unless his evidence has more than a dubious preponderance. • • •" (Italics ours.)

See also *Diamond Rubber Co. vs. Consolidated*, 220 U. S. 428, at p. 434 near bottom, and *Mumm vs. Decker & Sons*, 301 U. S. 168, at p. 171.

no corps of engineers to whom it could refer the problem for solution. On the contrary, its president and vice-president, Messrs. Withrow and Close, attacked the problem in the only way open to them, *viz.*, the building of burner after burner and placing them lighted in an exposed place on the roof of their factory building where they could watch their performance from the office window. Each new burner was tested alongside the best of their previous experimental burners and the burner of the patent in suit was finally developed and adopted as the best.

It is pure fiction to assume that they or anyone else could have solved this problem merely by studying the burners of the prior art and applying the knowledge thus obtained to the problem in hand. The records are utterly devoid of anything on which to base such an assumption. Conversely, the New York record discloses two unsuccessful attempts to solve the problem, and shows further that when the experienced Mr. Currie of the Dietz Company attempted to overcome the objections to the open flame Toledo torch, he proceeded in precisely the same manner that Withrow and Close followed, by making up burners and testing one after another in the open air either at the Dietz factory in Syracuse or at his summer cottage at a lake near that city. Currie's experience is the more impressive because of the fact that he had had many years' experience in the burner field as Works Manager for the Dietz Company and was an extensive inventor in his field; also because he had available and examined the patent files of the company and was intimately familiar with the construction and operation of the Rutz flash igniter before starting his unsuccessful experiments which were carried on during the greater part of the year 1928.

While it may be true that "the patent law does not reward mere persistence, unassociated with original creative effort," as stated in the Sixth Circuit opinion, it is also true, as stated by this court in *Diamond Rubber Co. vs. Consolidated Tire Co.*, 220 U. S. 426, 435, that:

> "* * * Many things, and the patent law abounds in illustrations, seem obvious after they have been done, and, 'in the light of the accomplished result,' it is often a matter of wonder how they so long 'eluded the search of the discoverer and set at defiance the speculations of inventive genius.' * * * Nor does it detract from its merit that it is the result of experiment and not the instant and perfect product of inventive power. A patentee may be baldly empirical, seeing nothing beyond his experiments and the result; yet if he has added a new and valuable article to the world's utilities he is entitled to the rank and protection of an inventor. And how can it take from his merit that he may not know all of the forces which he has brought into operation? It is certainly not necessary that he understand or be able to state the scientific principles underlying his invention, and it is immaterial whether he can stand a successful examination as to the speculative ideas involved." (Citing a large number of cases.)

That Withrow and Close "added a new and valuable article to the world's utilities" will not be denied; that the flame produced by the device of the patent is just as effective a warning signal as was the flame of the old type torch is not questioned; that the device of the patent meets the tests of the State Highway Departments while the old type torch does not is admitted, and that it accomplishes this desirable result at a saving of more than 30% in fuel consumption and with a practical elimination of wick consumption is abundantly proven.

Having obtained its patent the Toledo company pursued a plan which is beyond criticism. Not only did

it immediately place the invention on the market in the form of complete torches and flares, but it made the patented burner in such form that it could be purchased separately and substituted for the open flame burners of its old type Toledo torches then in the hands of the public.

Furthermore, plaintiff granted unrestricted licenses on the low royalty of 3c per torch, flare or burner, to all competitors who wished to operate under its patent.

Summary of Point 2

In brief summation of this point it is submitted on the foregoing that what the patentees did amounted to invention. Certainly there is no justification for the holding of the Sixth Circuit Court of Appeals that it did not amount to invention, on the theory that anyone skilled in the art, with the knowledge of the prior art here relied upon, could have done what the patentees did. We can conceive of no better or more persuasive evidence to negative such an assumption than concrete instances of extensive unsuccessful efforts by skilled and experienced inventors over considerable periods of time, with knowledge of the prior art here relied upon, to produce a flare or torch which would function and serve like and for the purposes for which the patented torch was created. The usual mythical man skilled in the art has been replaced in this case by living people possessed of and urged by every inducement to succeed. When they failed, notwithstanding their best and most skilled efforts, how can the mere assumption of want of invention be said to overcome the presumption of validity which attached to the patent on its grant?

Point 3. The Patent Is Infringed

The alleged infringing structures—the Bolser, Kari-Keen and Anthes flares—embody the same elements combined in substantially the same way as described and claimed in the patent and operate with substantially the same economy and efficiency to produce the same results as are produced by the "Economy" burner made under the patent by the owner thereof.

The Bolser, Kari-Keen and Anthes flares are similar in construction. All have been held to infringe, the Bolser and Kari-Keen by Judge Hahn in the Ohio cases and the Anthes by the Circuit Court of Appeals in the New York case. None of the four courts has questioned infringement, nor do we believe that it will be seriously questioned here. The infringing structures differ from plaintiff's Economy flares made under the patent in suit and from the patent drawing (except for matters of shape) only in that the guard in the infringing devices has been elevated a short distance above the fuel tank and the air inlet openings placed in the flange which supports the cap instead of in the sides of the cap.

A sectional view of the Bolser flare appears on page 319 and a similar view of the Kari-Keen flare on page 321 of the New York record. A similar view of the Anthes flare, with claims 2, 5, 11 and 12 of the patent applied thereto appears on page 297 of the New York record and corresponding views of the Bolser and Kari-Keen flares, with claims 2 and 11 applied are found at pages 161 and 162 of the Ohio record.

Claims 2, 5, 11 and 12 are applied to the drawing of the patent in suit at page 291 of the New York record.

The same arguments of non-infringement were urged

in both cases. Referring to defendants' contentions in the Ohio cases, Judge Hahn stated (Ohio R. 28, 29):

"If the patent in suit is valid, I think defendants' devices infringe all of the claims relied upon. Plaintiff's commercial device is represented by Exhibit 3-A and the drawing Exhibit 2-A. The Bolser torch is represented by Exhibit 3-B and the drawing Exhibit 2-B. The K-K torch is represented by Plaintiff's Exhibit 3-C and the drawing Exhibit 2-C. The main argument against infringement, as I gather it, is based upon the manner or method of disposing or mounting the cap upon the torch body. It is said the claims call for the mounting or disposing of the cap directly or immediately upon the torch body.

"Defendants' expert testified that Withrow's contribution to the art is his teaching that the cap be mounted or disposed directly or immediately upon the torch body as appears in the exhibits just referred to. I cannot agree with this interpretation of the patent. **I think that its main purpose and teaching is to protect the flame at its source and that this idea has been appropriated in defendants' devices.** There is authority, too, for saying that where location is one element in a combination, a fair construction of the language of the claims is obtainable only from a study of the entire patent. *Deister Concentrator Co. vs. Deister Machine Co.*, (C. C. A. 7) 263 Fed. 706, 709, 710. Such a study shows that the essence of the invention here is protection of the flame at the source, which is accomplished by defendants' devices also. In any event, Exhibit 3-B avoids the language of the claims only by almost imperceptible and immaterial differences. **To hold non-infringement on this ground would be clearly to sacrifice substance to form.** Plaintiff's Exhibit 3-C is said not to infringe because the cap is mounted not upon the torch body but upon an extension of the wick tube. It seems to me, however, it is just as fair to say that the wick tube in Exhibit 3-B is a part or extension of the torch body, within the meaning of

the claims (although the so-called wick tube is made as a separate part), and that the cap is disposed or mounted upon the torch body within the meaning of the claims fairly construed. (Emphasis ours.)

"It is said that if defendants' devices come within the language of the claims, they read directly on Almond No. 193,796, and hence that as to this claim the alleged infringing torches are within the prior art. But if the claims read on Almond, they do so as a matter of phraseology only and not as a matter of substance, and defendants do not escape infringement upon the ground urged. The differences between plaintiff's device and the accused devices are arguable differences only; the substance of plaintiff's invention has been appropriated, and the devices infringe all of the claims relied upon."

In finding infringement of claims 2, 5, 11 and 12 by the Anthes flare Judge Manton stated (N. Y. R. 453):

"But defendant says it avoids infringement because in its device the flange which supports the cap is elevated a short distance above the body of the torch and the air inlet openings are located in this supporting flange instead of in the side of the cap. No statement in the claims of specifications requires that the cap rest directly on the body of the torch, nor that the air inlet ports be located in the body of the cap. The patentees state that while they have shown and described the constructions 'which admirably fulfill the objects primarily enumerated, it is to be understood that the above description * * * is given by way of illustration and not of limitation.'

"Claim 2 calls for a 'flame guard for said wick mounted on the outside of the said torch body, said guard including * * * air ports.' In appellee's device the flame guard is mounted on the outside of the torch body. There is no doubt that the flame guard includes both the cap and its supporting flange and that the flame guard includes air ports.

"Claim 5 calls for 'a guard fitting over the outer end of the wick * * *, said guard having an imperforate top wall and side flame and air openings.' Considering the guard as including both cap and supporting flange, appellee's flare has air openings in the guard at the side of the wick,—an important consideration—rather than locating them in the side of the cap.

"The non-infringement of claim 11 is based on the claim that appellee has separated the wick-tube-supporting and heat-receiving portions of the flange of the patent. But this overlooks the rule that infringement cannot be avoided by substituting two parts for a single part of a patented structure when the two parts perform the same function as does the single part of the patent. *Arthur Colton Co. vs. McKesson & Robbins, Inc.*, 58 Fed. 157, 158; *Line Material Co. vs. Brady Electric Mfg. Co.*, 7 Fed. 2, 48, 50.

"As to claim 12, it is contended that the word 'lateral' applies to the location of the air openings and requires that they be in the cap. The air inlets in the supporting flange of the appellee's flare are located laterally with respect to the wick and wick tube, as are the air inlets of appellant's device.

"These arguments, as to non-infringement, fail to give effect to the established rules that infringement exists **if the substance of the invention which is defined by the claims, as distinguished from its form,** is appropriated, and that infringement of a combination claim is not avoided by reason of the fact that the appellee is free to use some or all of the separate elements of the combination because they existed in the prior art. *Smith vs. Snow*, 294 U. S. 1; *Winans vs. Denmead*, 56 U. S. 329; *Sanitary Refrigerator Co. vs. Winters*, 280 U. S. 30; *Hillard vs. Fisher Book Typewriter Co.*, 159 Fed. 439, 442." (Emphasis ours.)

It is believed, therefore, that infringement is clear.

CONCLUSION

The patent in suit is for a wholly novel and exceptionally useful device. It was created as a result of intensive and extensive experimentation, induced by numerous complaints from users of prior devices intended for the same purpose. Its production was attended by commercial acceptance which was so extensive in character that it completely supplanted the prior flares or torches and rendered them obsolete. Others skilled in the art had tried to invent or create a device which could be as efficiently utilized—all without success. The interested art either acknowledged the patent and asked for and received licenses thereunder, or, like the defendants in these cases, openly copied and infringed. The decision of the Second Circuit Court of Appeals that under these circumstances the patent was validly granted for an invention was correct, and the decision of the Sixth Circuit Court of Appeals was in error.

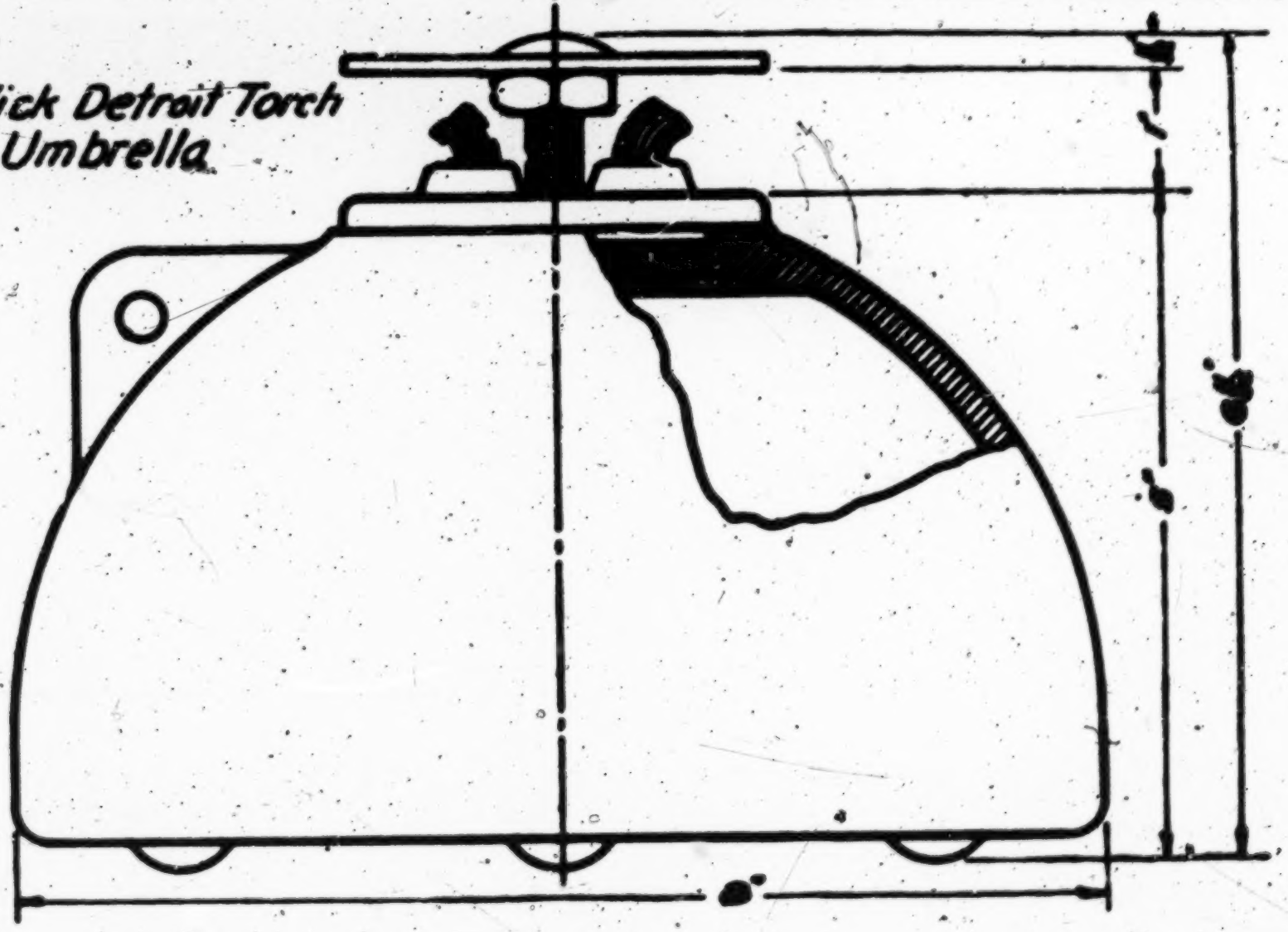
Therefore, the decision of the Second Circuit Court of Appeals should be affirmed, and that of the Sixth Circuit Court of Appeals should be reversed.

Respectfully submitted,

WILBER OWEN,
Solicitor for The Toledo Pressed Steel Company.

SAMUEL E. DARBY, JR.,
Of Counsel.

Three-Wick Detroit Torch
With Umbrella



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IN THE
Supreme Court of the United States
October Term, 1938

No. 166

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Petitioner,

vs.

STANDARD PARTS, INC.,
Respondent.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
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HUEBNER SUPPLY COMPANY,
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I. CONTROVERSIAL QUESTIONS OF FACT

Opponents' briefs raise several fact issues requiring consideration.

(a) History of the Torch Industry

Under this heading petitioner in the New York case attributes the first sheet steel pot torch to McCloskey and

intimates that the Toledo Company took some unfair advantage of him. It appears at pages 77 and 82 of the Ohio record that McCloskey originally sold torches for the Toledo Company and later secured outside financial help in securing the patent therefor in his own name. Mr. Close testified (Ohio R, 82):

> "When we originally went into the matter, we made a torch that we had developed. That torch we manufactured and he sold."

Another misstatement in the discussion under this heading is that during the period 1929 to 1933 burners of the patented type here involved were used only for construction work and that their use as warning signals for parked trucks and busses began with the passage of an Iowa law in 1933. The tabulation on page 15 of the Montgomery Ward brief indicates that the Toledo Company's truck flare (Exhibit 19) was not manufactured and sold until 1934. This is directly contrary to the evidence.

The first sale of the Toledo Company's Economy truck flares was made on October 16, 1929. These flares were known as the Model F, were smaller than the Economy torch and were made particularly for trucks. The Model F flare was produced as a result of a report received from a dealer in Michigan calling the Toledo Company's attention to a Michigan law or order requiring trucks to carry torches as warning signals when parked on the road at night.[1] This Model F flare was illustrated in plaintiff's first flare circular, one of which is bound in the Ohio record at page 184. In that circular there is printed a letter from the Michigan Public Utilities Commission, dated October 24, 1929, which states that the torch made by the Toledo Company, passes the

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[1] Ohio R. 68, bottom.

requirements of the Commission "in reference to this Commission's Order No. β-LJ, Rule F, regarding all common carriers carrying two oil burning torches."

The inference sought to be conveyed by petitioner is that the demand for a torch like that of the patent in suit was created by the passage of state laws requiring their use around parked trucks and busses. As stated by this court in *Diamond Rubber Co. vs. Consolidated Tire Company*, 220 U. S. 428, 442, where a similar argument was made, this is "an inversion of cause and effect, * * *."

(b) Unreliability of Open-Flame Torch

At page 41 of its brief Montgomery Ward reproduces one of the early Toledo circulars, and at page 13 quotes from it the statement that it "will burn all night, anywhere, at any time, in any kind of weather." The evident purpose is not to show that the open-flame torch was in fact reliable, but to reflect on the good faith and integrity of the Toledo Company and its officials, thereby to discredit their claims for efficiency and economy with respect to the patented burner. This purpose appears from the statements at the top of page 40 of the Montgomery Ward brief.

The reliability of the patented burner and the unreliability of the open-flame burner are abundantly established without relying on inferences drawn from statements in advertisements published prior to the date of the invention. Incidentally, McCloskey made the same claims of efficiency for the open-flame torch in his early advertising,[2] but he promptly abandoned that torch in favor of a protected wick torch when Withrow and Close

(2) N. Y. R. 299.

had shown him that the source of the flame could be protected without interfering with the efficiency of the outside flame as a warning signal.

In Montgomery Ward's attempt to belittle the commercial success of the patented device it fails to mention the fact that more than thirty-five thousand of the patented Economy burners were sold separately by the Toledo Company during the period from 1929 to 1934 to owners of the old Toledo open-flame torch, to be substituted for the burners with which those torches were originally equipped.[3] Over eighteen thousand of these separate burners were sold during the year 1929, which brings the total sales of the patented device for that year up to 64,983 as compared with total sales of 39,000 for the old device during the previous year. To give a true picture, the sales of separate Economy burners should be added to the sales noted by petitioner[4] for the years 1929 to 1934 and deducted from the sales of the old type torches noted for the years 1926 to 1928. The total sales of all old type torches for the three years were 66,751 and the total sales of separate Economy burners for use on these old type torches up to the end of 1934 were 35,361, which left only 31,390 of the old type Toledo torches in use, assuming that none had been lost or destroyed.[5]

Petitioner's table of sales also is in error in that it indicates the first sales of plaintiff's truck flares (Exhibit 19) to have been in 1934. As heretofore noted, these flares were introduced by the Toledo Company in October, 1929, and they were sold continuously thereafter.

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(3) The Toledo Company never sold the caps of its burner separately as stated at the top of page 14 of the Montgomery Ward brief. It sold complete Economy burners, intended for substitution for the old Toledo type open-flame burner. These Economy burners consisted of complete units—screw-collar adapter, wick-holder, hood or cap and wick.

(4) Montgomery Ward brief, page 15.

(5) N. Y. R. 25, f. 75 and p. 26, f. 77.

The advance made over the old style open-flame torch strikingly appears from Currie's testimony that upon examining and testing one of Toledo Company's patented torches it became evident that if his company "desired to remain in the competing field we would have to have something as good."[6]

(c) Fuel Economy of the Patented Torch

The Montgomery Ward brief attacks the claims for fuel economy made by the Toledo Company, basing its criticism on the results of indoor tests conducted by Professor Croft. Those tests are open to two criticisms, either one of which is sufficient to show their unreliability for the purposes of determining fuel economy of the patented torch as compared with its predecessor, the open-flame torch. The first criticism is that Professor Croft used the same wick extension (3/8") for the protected and unprotected wicks, thereby adopting a condition for the open-flame torch which had been found impractical in outdoor use. In an effort to justify the use of only 3/8" wick extension in the Croft tests of open-flame burners, it is asserted that 1/2" wick extension is all that is necessary, and that this is the extension used in the three-wick torches of the Detroit Street Railways. Total wick exposure is the element which determines fuel consumption and also the ability of the flame to withstand heavy winds and rains. Three wicks extended 1/2" each would give more total wick exposure than would an extension of 1 1/2" for a single wick.

The experience of all three manufacturers of the open-flame torch was the same with respect to wick extension. Mr. Close testified on this subject in the New York case, stating that when his company started out

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(6) N. Y. R. 172, f. 515.

with the open-flame torch they wanted to have the wick extended as little as possible—that common sense dictated that. When complaints began to come in because the torches were being extinguished, they wanted to strengthen the flame and decided that a longer wick exposure would assist in solving that difficulty. After considerable experience in settling complaints and making tests of their own they found that an inch and a half was about the shortest length they could rely on for overnight service. He further stated that as they extended the wick the fuel consumption rose.[7] As a result of this experience the Toledo Company attached to each open-flame torch sold a yellow tag stating:[8]

> "The normal length of exposed wick is about one and one-half inches. Extend wick further for heavy weather conditions."

The experience of the Dietz Company regarding the necessity for extending the wick of the open-flame torch was the same as that of the Toledo Company. Mr. Currie testified that the wick in the Dietz commercial open-flame wick torch "had to be carried out about an inch and a half."[9] The McCloskey circulars reproduced at page 204 of the Ohio record and at page 299 of the New York record show a similar wick extension in the McCloskey open-flame torch.

The recommendation of the Toledo Company regarding wick extension for its patented torch is that the wick should project about one-eighth of an inch.[10]

Because these differences in the wick extension requirements for the two types of torches were disregarded

(7) N. Y. R. 48, f. 144.
(8) Ohio Exhibit 6 and N. Y. Exhibit 14.
(9) N. Y. R. 171, f. 513.
(10) N. Y. R. 259, center of page.

in all of the Croft indoor experimental tests, the results shown on the Croft graphs, one of which is reproduced at page 19 of the Montgomery Ward brief, are of no value on the question of relative efficiency of open-flame torches and the patented torch.

The other criticism of the Croft tests is that all his tests of burners with flame guards were made with two of the flame openings in the direct line of the air stream, so that the wind could enter one of these openings and pass directly out of the opposite opening without encountering any obstruction. Based on tests of this character, Professor Croft expressed the opinion that the Toledo Company's Economy burner is less efficient than the Anthes burner.

At page 22 of the Montgomery Ward brief testimony is quoted which, without explanation, indicates an agreement by the parties that the performance of the Economy and Anthes torches is "quite the opposite." This testimony refers to comparative tests which were made by the Toledo Company following the Croft deposition, for the purpose of checking the Croft data. Those tests showed that while the Anthes flare gave slightly greater luminescence than the Economy flare when the flame openings were placed at right angles to the air stream, as in the Croft tests, the Economy flare showed greater luminescence when the flame openings were placed at 45° to the air stream.(11) These were indoor tests, but the results regarding fuel consumption were confirmed by outdoor tests of the Economy and Anthes flares made under

(11) The comparative tests of the Economy and Anthes flares here referred to are reported at pages 185 to 188 of the New York Record. For records of other comparative tests of the different types of burners see Ohio R. 185-191; N. Y. R. 47, 307-309.

In the tests conducted by the Electrical Testing Laboratories for the State of Pennsylvania the torches were rotated at the rate of four revolutions a minute in order to simulate changing air conditions.

identical conditions. The tanks were filled with the same quantity of oil and weighed, the wicks similarly adjusted and lighted, and the flares placed outdoors side by side and burned for the same number of hours, after which the flames were extinguished and the devices weighed, from which the amount of fuel consumed per hour was computed. Exhibit 29 in the New York case covers outdoor runs of approximately eight hours each on seven days, beginning February 1, 1938, and ending February 9, 1938. The Economy flare burned an average of 1.637 oz. of kerosene per hour and the Anthes an average of 1.633 oz. per hour. At the same time an open-flame Toledo torch, with 1½" wick extension, burned 4.634 oz. per hour and the Detroit 3-wick torch with ¼" wick extension burned 4.238 oz. per hour.[12]

Dr. Olsen conducted a similar outdoor test of three each of the Economy and Anthes flares placed on a fire escape at the Brooklyn Polytechnic Institute on a very windy day early in March, 1938. The average fuel consumption for the Anthes was 2.05 ozs. per hour and for the Toledo 1.95 ozs. per hour.[13]

It is not without significance that in the chart which Montgomery Ward has reproduced at page 19 of its brief the data relating to the tests made without the flame guard stops at 14 m.p.h. wind velocity, whereas that with reference to the tests of the same burners equipped with flame guards run beyond the limits of the chart. Professor Croft testified that the apparatus used in his tests was capable of developing a wind velocity of 33 m.p.h. and that both the Economy and Anthes torches remained lighted at that maximum wind velocity.[14] He further

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(12) N. Y. R. 308, 309.
(13) N. Y. R. 241, f. 722.
(14) N. Y. R. 157, f. 471.

stated that he conducted practically all of his tests below a wind velocity of 10 m.p.h. "because at a slightly higher velocity one of the flares was extinguished without the flame guard. * * *"—thus showing the inadequacy of the short wick extension.[15]

(d) The Prior Art Before the Examiner

On page 6 of the Montgomery Ward brief the statement is made that Hathaway No. 147,496 was the only patent before the Examiner. The file history was not offered in evidence in either case. As stated in the answers in the Ohio cases, twenty-two United States patents and five foreign patents were before the Examiner.[16] The wide field from which to select references of the character relied on is indicated by the fact that Defendant's Exhibit N, Book of Patents in the Ohio cases, contains twenty United States patents and Montgomery Ward Exhibits C and D contain thirty patents and six publications, only ten of the references in the two cases being duplicates. It is not surprising that with such a large field to draw from the defendants avoided citing most of the patents which were considered by the Examiner. It is of interest that the prior art references most strongly relied on in the Ohio cases, Almond No. 193,796 and Billingham 181,030, are not relied on at all in the New York case.

(e) Zone of "Comparatively Quiescent Air"

Montgomery Ward contends that the Anthes flare has no zone of "comparatively quiescent air." The Toledo Company's expert, Dr. Olsen, gave the only testimony on this subject. His testimony, which is referred

(15) N. Y. R. 162, f. 486.
(16) Ohio R. pages 9 and 10.

to at the bottom of page 23 of the Montgomery Ward brief, was that "there couldn't be a layer of **quiescent** air."[17] (Emphasis ours.) He testified regarding the presence of a zone of **comparatively** quiescent air, as described in the patent in suit. Referring to the Economy burner, which is manufactured by the Toledo Company under that patent, Dr. Olsen testified (N. Y. R. 196, f. 588):

> "Now, I found that this device had a little chamber, I call it a combustion chamber, in the bottom of the cap, and that this is protected, and there are some air holes which are restricted, not too big, so that when you once light it you have a little chamber where a little air is admitted, and which maintains the temperature of the wick to the point where it will give off vapor."

Subsequently testifying regarding both the Economy and Anthes burners, Dr. Olsen said (N. Y. R. 198, f. 593, and p. 199, f. 596):

> "Each of these two instruments also had restricted air openings into this combustion zone which I have designated, and therefore it would keep this little flame operating. * * * In each case there was enough air admitted to maintain this flame in the combustion zone which, to my way of thinking, is the actual, the essential part of this device, or at least a very essential part, that they do maintain that flame and under high wind conditions, so I couldn't see any essential difference between them."

There is no zone of **quiescent** air in any of these devices, but below the flame outlets in each of them there is a zone where the air is **comparatively** quiescent, as described in the patent, and this is equally true whether the air inlets are in the sides of the cap or in the flange which supports the cap.

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(17) N. Y. R. 91, f. 271.

(f) Currie's Statement That He Must Have Had in Mind That a Torch Could Be Protected From Rain by Placing a Flat Shield Over the Top

In support of Montgomery Ward's contention that it required no invention to protect the wick of a signal torch from wind and rain without interfering with the effectiveness thereof as a warning signal, at page 16 of its brief, it quotes the testimony of Currie that the thought that he might put a flat shield over the top to keep out the rain must have been in his mind, but that he just didn't do it. This statement by Currie must be interpreted in the light of the fact that following several months of intensive experimentation, he admitted his failure to solve the problem he was working on and had his company place on the market a substantial duplicate of the Toledo open-flame torch, Exhibit 10 in the New York case. The statement referred to was made during Currie's cross examination. He did not state that it occurred to him to place a cover over the top of his Exhibit 37, but that it **must have** occurred to him. He was speculating and not testifying to a fact. While Currie may have known that to place a cover over the wick would protect it from rain, he did not do it, just as Kerwin of the Detroit Street Railways may have known that to place a guard around the sides of the flame would protect it from wind, but he did not do it. Neither Currie nor Kerwin could see how it would be possible to use both a cover and a side guard and still preserve the function of the device as a warning signal. It remained for these patentees to discover and disclose to the world how this could be done, after which Currie's company and McCloskey, Toledo Company's only competitors in the manufacture and sale of torches for use

as warning signals, adopted plaintiff's solution of the problem and, as stated by Judge Hahn in the Ohio cases, **there has been no substantial improvement since.**

The statement at the top of page 47 of the Montgomery Ward brief that "Currie of the Dietz Company was **half-heartedly** experimenting in an attempt to get something better than the open-flame Toledo torch" is not supported by Currie's testimony. On the contrary, he testified that he experimented with an open-flame Toledo torch "for the better part of that year, the year 1928 I think it was."[18] And on cross examination he testified (N. Y. R. 173, f. 519):

> "In 1928 I started experimenting, trying to improve this open-flame torch. The experiments that I made were outdoor tests, both around the factory, and then we have a cottage out about twenty miles, out at a lake, and I was experimenting there every day, principally at night only when I got home. I had the various structures made for me."

He also testified:

> "Our experimentation did not produce a structure which I regarded as better than the open wick type of torch that we ultimately brought out." (N. Y. R. 171, f. 513.)

(g) The Anthes-Rutz Combination (New York Exhibit L)

Some fifteen million of the Rutz flash igniters were sold, and open-flame pot torches had been in use as warning signals around excavations and obstructions since time out of mind. The fact that they would be extinguished by hard winds and heavy rains must have been known to thousands, yet it remained for these patentees

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(18) N. Y. R. 168, f. 503.

to discover that by placing a hood or cap over the exposed end of the wick with suitable provision for the inlet of air and the escape of hydrocarbon vapors the flame could be maintained in all kinds of weather, without enclosing that portion of the flame which acts as a warning signal. It did not occur to Currie when, as factory manager of the Dietz Company he was endeavoring over a period of several months to discover means for protecting the flame of these outdoor warning signals, to try placing the Rutz cap, with which he was thoroughly familiar, over the end of the wick.

No such combination had ever been made or suggested prior to the issuance of the patent in suit, and the fact that Anthes' expert was able to find a Rutz cap which could be fitted over the wick holder of the Anthes flare (first made in 1934 under a license from the Toledo Company), and thus accomplish in some degree the benefits and advantages of the torch of the patent in suit, does not establish lack of invention in the discovery that new and theretofore unknown beneficial results could be obtained by the structure of the patent in suit.

(h) The Russian Patent to Malcov

As pointed out in our main brief, the experts were unable to state definitely what this patent discloses or how it was intended to work. Our interpretation of this patent is that the funnel-shaped element shown in Figs. 2 and 3 is a container for "asbestos, crushed charcoal or some other incombustible material readily conducting liquid," which covers the wick and extends to within one-fourth inch of the top of the funnel, thus leaving a free space for the vapors to accumulate and pass out through small perforations in the dome and upper portion of the

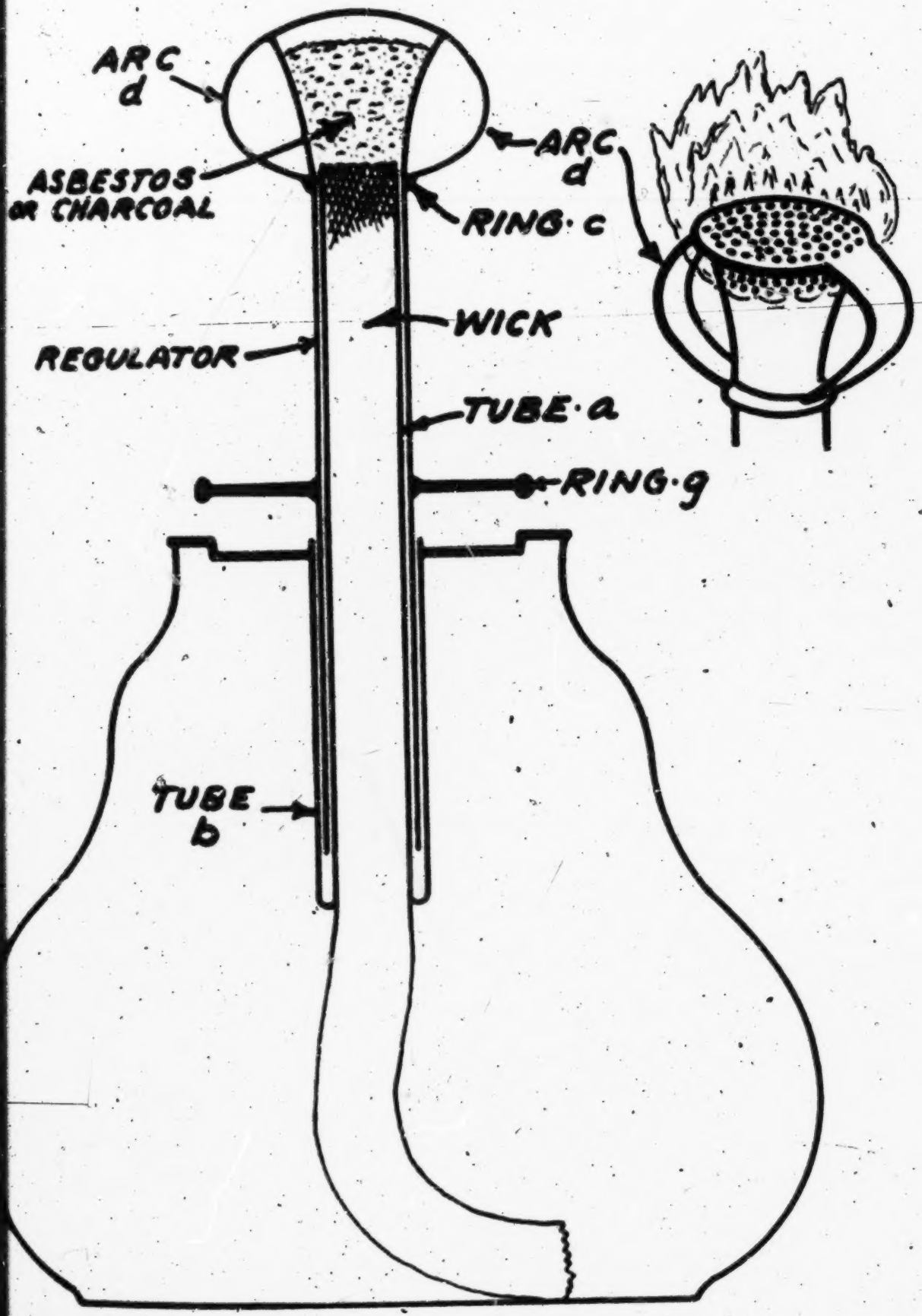
funnel, to burn entirely outside the burner. As stated in the patent the two arcs *d d* do not constitute an essential part of the burner. In other words, the burner would operate as intended, without these arcs. Remove them from Montgomery Ward Exhibit I and no burner would remain. Furthermore, the exhibit omits entirely the tubes *a* and *b*, which the patent states are "for the purpose of preventing the gas, which is fairly heavy, from passing downward (and escaping), as otherwise not all of the gas would pass through the openings provided in the upper portion and would not combust completely, but would volatile without usefulness." The Malcov patent does not state what fuel was intended nor what the burner was to be used for. Probably the fuel was alcohol, which has a heavy vapor, and the burner was intended for heating by a blue alcohol flame, and not for lighting.

Exhibit I in the New York case does not respond to the patent description. An interpretation of the disclosure which does respond to all parts of the description is shown on the opposite page.

(i) Almond Patent No. 193,796

Respondents in the Ohio cases select the Almond patent No. 193,796 as the best reference. This was also the selection of their expert. The brief calls attention to the testimony of the expert that he had tried Exhibit G, offered as representative of the Almond burner, and found that it burned just the same as the others. The character of that trial appears from the cross examination of the expert at the bottom of page 129. It was made in a vacant lot adjoining a hotel in Toledo, surrounded by buildings. No evidence was submitted regarding weather conditions or wind velocity, the witness merely

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stating that they "were in a pretty drafty place." Respondents' Exhibit G, thus tested, represents only a small portion of the Almond device which has been lifted from its intended environment and has been modified with respect to both flange and openings, to suit the purposes of the expert, who admitted that he "never tried this Almond device made up in accordance with the patent drawings." The device he tested did not have the shield G of the Almond patent, without which the patentee states "the degree of combustion and good heating flame will not be obtained." The expert further testified that he had no knowledge of how the Almond device would operate "as a vapor burner," for which it was intended by Almond.[20]

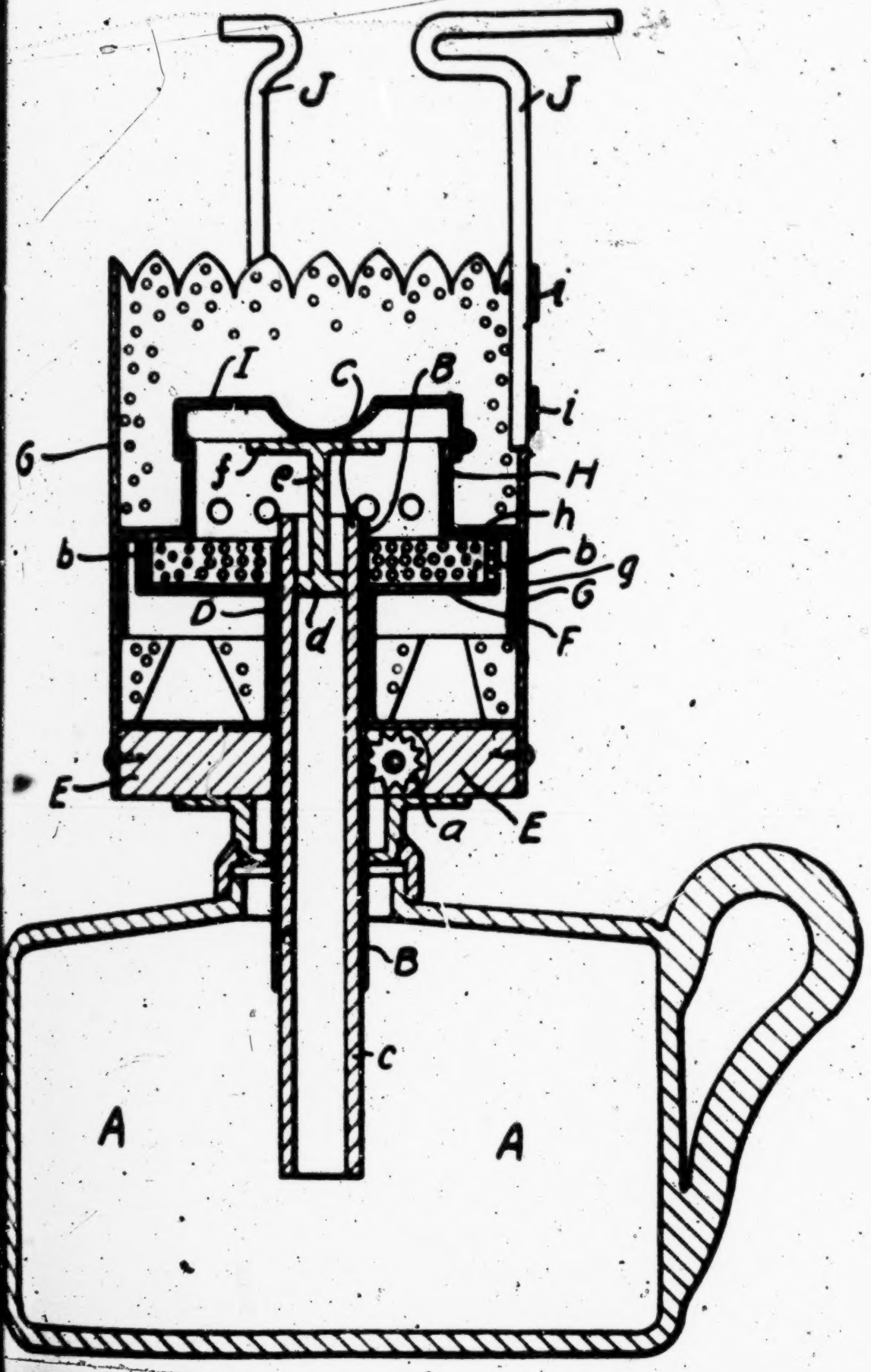
There is no justification in the Almond patent for the statement at the top of page 10 of Ohio Respondents' brief that the device will become an illuminating lamp on removing the tube G. On the contrary, the patent indicates that this tube should not be removed. At page 25 of Respondents' brief they have shown the Almond heater in the form in which they state it would become an illuminating lamp, with the tube G removed. A better understanding of the Almond device will be obtained from an enlargement of Fig. 1 of the patent drawing, shown on the opposite page. The parts which Respondents have lifted out of this device and call the flame guard of the patent in suit are colored red.

The lack of pertinency of the Almond heating burner is reflected by the fact that petitioner's counsel and expert in the New York case made no reference to it during the hearing in the District Court other than to offer a copy of the patent as one of those referred to in the Sixth Circuit opinion.

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(20) See cross examination, Ohio R. 109-116

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The answer in the New York case (R. 12) refers to the Ohio cases and states "the fact to be that on the trial of said suits the defendants therein did not offer in evidence the pertinent prior art, nor did the court consider or have before it the pertinent prior art bearing on the validity of said letters patent; * * *."

(j) Billingham Patent No. 181,030

This is the second choice of respondents in the Ohio cases as showing anticipation. This patent is not referred to in the Sixth Circuit opinion and is not included in the book of prior art patents in evidence in the New York case as Defendant's Exhibit C. A catalog page illustrating this device as manufactured by the owner of the Billingham patent is reproduced at page 215 of the Ohio record, and a street lamp torch made in exact accordance with this illustration is in evidence in the Ohio case as Plaintiff's Exhibit 32. Mr. Withrow tested this exhibit under various conditions, using sperm oil as recommended by the manufacturer and also kerosene as used in the Withrow and Close torch. He found it impossible to so adjust the wick that the flame would emerge from the openings in the casing, and that when used as shown in the catalog cut the device operated precisely as stated in Heath patent, 66,021, for a similar device, as follows (Ohio R. 229):

> "When the burner (street gas lamp) is to be lighted the apparatus (of the Heath patent) is inserted through the bottom of the lamp, till its end, coming in contact with the handle, turns it over into the position represented in dotted lines. The cock of the burner is thus opened, and the gas escaping therefrom, entering through the apertures b and b' (of the Billingham lighter), comes in contact with the flame of the lamp C and is thereby lighted."

(k) Other Patents Referred to by Ohio Respondents

Although copies of the Blake, Heston and Kahn patents are included among the prior art patents offered in the New York case, they were not referred to by the expert in that case. They were offered merely because they were mentioned in the Sixth Circuit opinion. The Reekie patent, also referred to in that opinion, was not even offered in the New York case. We note, however, that the Kahn patent is for a flash igniter similar to the Rutz patent relied on in the New York case, and what has been said in our main brief regarding Rutz applies equally to Kahn.

Wall patent 228,497 for a mill lamp is referred to repeatedly in petitioner's brief in the New York case for the purpose, as we understand, of showing that the patent in suit was not the first to disclose the broad combination of a tank for fuel, a wick, and some kind of a guard for the flame. Petitioner does not contend that this mill lamp would remain lighted in even a moderate wind if used outdoors. It contains three separate wick tubes and wicks, only the center one (marked E) of which is provided with the part which petitioner refers to as a flame guard. An air flue H leads from this central burner down through the fuel container and out of the side of the tank near the bottom. The so-called flame guard is referred to as a "detachable burner," and is entirely open at bottom and top, with no side openings whatever. In fact, it closely resembles the ordinary burner used in lamps and lanterns, minus the glass chimney. The patent states that when "the lamp is used for a moving light the wicks in the tubes B and C are lighted." These two wicks are entirely unprotected. The lack of pertinence of the Wall patent appears from the

fact that it was not set up as a reference in any of the answers and was not referred to by any of the experts.

II. ARGUMENT

The invalidity of the patent in suit is asserted on three grounds. Respondents in the Ohio cases and petitioner in the New York case all assert the defenses of anticipation and lack of invention, but on different grounds, and petitioner in the New York case asserts that claims 2 and 5 are void as covering aggregations rather than true combinations. These three defenses will be briefly considered.

(a) The Patent in Suit Is Not Anticipated

In the Ohio cases respondents assert that the patent to Almond anticipates all the claims in suit and attempt is made to apply the wording of the claims to different portions of the Almond structure. The totally different purposes for which these devices were designed and their wholly divergent uses (if in fact the Almond device ever was used) are disregarded and the claims treated as mere assemblies of words. Almond is for an indoor heating device, whereas the patent in suit is for an outdoor construction torch. To further distinguish from such non-analogous prior art devices each claim in suit opens with the limiting clause "In a device of the class described" or "A burner for a construction torch adapted to emit a luminescent flame." This same defense was urged in the Sixth Circuit Court of Appeals and was disregarded in the opinion of that court.

The classic statement of Mr. Justice Bradford in the opinion of this court in *Consolidated Valve Co. vs. Crosby Valve Co.*, 113 U. S. 157, is pertinent. He stated (p. 170)·

"In regard to all of the above patents, adduced against Richardson's patent of 1866, it may be generally said, that they never were, in their day, and before the date of that patent, or of Richardson's invention, known or recognized as producing any such result as his apparatus of that patent produces, as above defined. Likenesses in them, in physical structure, to the apparatus of Richardson, in important particulars, may be pointed out, but it is only as the anatomy of a corpse resembles that of the living being."

Petitioner in the New York case asserts that claims 2 and 5 are anticipated by the Russian patent to Malcov and claims 11 and 12 by the patent to Rutz for a flash igniter. The remarks in connection with Almond are equally applicable to these patents. "Mere literalism in statement of the claim should not defeat a meritorious patent."(21)

In *Lakewood Engineering Co. vs. Walker*, 23 Fed. (2) 623 (C. C. A. 6), the patent was for "a road-surfacing device, comprising a flat pliable strap, and handle bars at the ends thereof." In holding the patent valid, the court said (p. 623):

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(21) *Belber Trunk & Bag Co. vs. Seward Trunk & Bag Co.*, 279 Fed. 82, 83 (C. C. A. 2). See also the opinion of the Seventh Circuit Court of Appeals in *Nordberg Mfg. Co. vs. Woolery Machine Co.*, 79 Fed. (2d) 685, 690, where the court stated:

"The District Court's ruling in sustaining the claims in suit was explicitly based upon the principle that the first clause of the claims, 'in a machine of the character described' should be constantly considered in determining the question of anticipation. That premise is sound. By it the scope of the patent is limited, and by it the patent is protected against alleged anticipations. This court has held claims valid in which elements were literally met in some non-analogous use device, but where the reference was intended to operate for a different purpose and object, and did not answer the introductory clause of the claim. *Duncan vs. Stockham* (C. C. A.) 204 F. 781; *Schram Glass Mfg. Co. vs. Homer Brooke Glass Co.* (C. C. A.) 249 F. 228; *Benoit vs. Wadley Co.* (C. C. A.) 54 F. (2d) 1041. These decisions are supported by the following: *Seymour vs. Osborne*, 11 Wall. 516, 20 L. Ed. 33; *Consolidated Roller-Mill Co. vs. Walker*, 138 U. S. 124, 11 S. Ct. 292, 34 L. Ed. 920".

"We have little difficulty with the earlier patents and devices which are set up as anticipations or as inconsistent with the existence of any invention in what Walker did. They do not respond to the letter of the claims, because they are not road-surfacing devices; nor to its spirit, because they are in fields too far away."(22)

(c) The Patent in Suit Is Not Invalid for Lack of Invention

Opponents' arguments of invalidity for lack of invention over the prior art are directed to efforts to show that with the disclosure of the patent in suit before him a mechanic would have no difficulty in combining with the old open-flame oil burning wick torch a cap or hood taken from some prior art patent or structure, in such manner as to accomplish in some degree the results and advantages obtained by the patented torch and by each of the torches charged to infringe.

This argument ignores the rule, established by this court in early cases and frequently applied, that invention may reside in the conception or discovery that a new and useful result may be obtained by combining elements which in themselves may be either new or old, even though it may require no invention to so combine them after the road has been marked.

National Cash Register Co. vs. Boston Cash Indicator & Recorder Co., 156 U. S. 502, 514, 515.

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(22) In a footnote to the opinion, the court said:

"Many a claim to a device or an article has been sustained, because its reference to its purpose or use was thought enough to distinguish it patentably from earlier devices, which would be covered by its otherwise too broad words of structural description—e.g. as old continuous cement lining claimed in a pulp digester, *Munising vs. American Co.*, (C.C.A.6) 228 F. 700; an old bituminous composition claimed as a street pavement, *Warren vs. Owosso*, (C. C. A. 6) 161 F. 309; an old compound claimed as a resistance element, *General Electric Co. vs. Hoskins Co.*, (C. C. A. 7) 224 F. 464."

Hobbs vs. Beach, 180 U. S. 383, 392.

Traitel Marble Co. vs. U. T. Hungerford Brass & Copper Co., 18 F. (2d) 66, 68 (C. C. A. 2).

H. C. White Co. vs. Morton E. Converse & Son Co., 20 F. (2d) 311, 312-313 (C. C. A. 2).

Hookless Fastener Co. vs. G. E. Prentice Mfg. Co., 68 F. (2d) 940, 941 (C. C. A. 2).

The rule was applied by this court in the *Cash Register Company* case as follows, in an opinion by Mr. Justice Brown (156 U. S. 502, 514, 515):

> "It did, however, require thought to conceive the idea (1) that a remedy for the existing defects in the machine lay in the independent operation of the wing; and (2) that such operation could be secured by a mechanical connection with the keys. Given these conceptions, it was more a matter of mechanical skill than of invention to devise such connection, since a similar train of mechanism had been operated by the keys for other purposes. • • • Indeed, this use of the connecting mechanism can hardly be termed analogous to such as similar mechanisms had been previously used for; but even if it were, the results are so important, and the ingenuity displayed to bring them about is such that we are not disposed to deny the patentees the merit of invention."

There is no evidence in the Ohio record which justifies the assumption that a mechanic skilled in the art and familiar with the prior structures relied on would have recognized that they could be combined to produce a solution of the problem confronting Withrow and Close, and the record in the New York case shows beyond question that there is no real basis for such an assumption.

The negative tests of invention set forth in the cases cited on page 26 of the Montgomery Ward brief and the discussion under point III of that brief serve to support our argument on the question of invention. In each of the cited cases where the question of invention was considered this court found that the advance ascribed to the patent there in suit was in fact to be found in the teachings of the prior art.

(c) Claims 2 and 5 Are Not for Aggregations

This defense is not set up in the answers in the Ohio cases, nor is it urged by respondents in those cases. The defense, as urged by petitioner in the New York case, disregards the controlling facts (1) that by combining a torch body and a flame guard of the general type shown in the Rutz patent the patentees Withrow and Close have produced a new and useful result, and (2) that the Rutz cap is only one of a number of elements which are combined to make the Rutz flash igniter. This latter fact clearly appears from the Rutz drawing as well as from the claims of that patent. Claim 1, one of the broadest of the Rutz claims, calls for the following elements in combination in a flash igniter:

(1) a torch head having a crown tip provided with radial ducts grouped to form a single pilot-light,
(2) a feed-pipe for the torch-head,
(3) a valve therefor having a by-pass for supplying a constant flow of gas to said torch-head to form a pilot-light, and
(4) a cylindrical dome provided with firing ports in radial alinement with the tip apertures but upon a slightly higher plane than said tip apertures.

As stated by defendant's expert in the New York case he lifted this fourth element of Rutz "from one purpose to another" in making the device offered in evidence as Exhibit L.

To so combine old elements as to perform new functions and produce new results has always been recognized as constituting invention, within the meaning of the patent statutes.

> Keystone Mfg. Co. vs. Adams, 151 U. S. 139, 144.
>
> Leeds & Catlin vs. Victor Talking Machine Co., 213 U. S. 301, 318.
>
> Same vs. Same, 213 U. S. 325, 332.
>
> Diamond Rubber Co. vs. Consolidated Rubber Tire Co., 220 U. S. 428.

In the latest of these cases, involving the Grant tire patent for a combination of several elements, each old and well-known in the tire industry, the court, in an opinion by Mr. Justice McKenna, stated (pp. 442, 443):

> "To what quality the utility of the tire may be due will bear further consideration, if for no other reason than the earnest contentions of counsel. Aside from those contentions and the ability by which they are supported, we might point to what it does as a demonstration of its difference from all that preceded it, that there is something in it, attribute or force, which did not exist before—something which is the law of its organization and function, and raises it above a mere aggregation of elements to a patentable combination. And we may say in passing the elements of a combination may be all old. In making a combination the inventor has the whole field of mechanics to draw from. **Leeds & Catlin vs. Victor Talking Machine Co.**, 213 U. S. at page 318."

In *Keystone Mfg. Co. vs. Adams* the same elements were combined as in older patents, the movement of one element—a revolving shaft with wings or protuberances—being reversed to produce a different mode of operation with improved results. In holding the patent valid the court stated, in an opinion by Mr. Justice Shiras (p. 144):

> "Where the patented invention consists of an improvement of machines previously existing, it is not always easy to point out what it is that distinguishes a new and successful machine from an old and ineffectual one. But when, in a class of machines so widely used as those in question, it is made to appear that at last, after repeated and futile attempts, a machine has been contrived which accomplishes the result desired, and when the Patent Office has granted a patent to the successful inventor, the courts should not be ready to adopt a narrow or astute construction, fatal to the grant."

Petitioner relies principally on the decision of this court in *Lincoln Engineering Co. vs. Stewart-Warner Corporation*, 303 U. S. 545, to support the argument that the claims are for an aggregation of old elements.[22] This decision must be considered in the light of the controlling facts there found to be present.

1. The improvement was directed solely to a single element of an old combination.

2. No new result was accomplished.

3. No change was made in the combination which

---

(22) Incidentally, the decision of this court in *Carlton vs. Bokee*, 17 Wall. 463, is cited and quoted from in connection with this same argument to demonstrate that it was common knowledge as early as 1872 to convey heat to the oil by means of the wick tube. However, this decision warned against using such a construction in connection with a kerosene burning torch such as that of the patent in suit. The sentence following the quotation appearing in petitioner's brief, page 40, reads: "Such an arrangement as this with petroleum (kerosene) would have produced a speedy explosion." If this decision can be said to have taught the patentees anything, it was to avoid the construction which they adopted.

affected the operation of the separate elements or the result produced by them as a whole.

4. The alleged invasion of the patent monopoly consisted in the manufacture and sale of the separate old unimproved elements for use with other elements of the patented combination (including the novel one) supplied by the patent owner.

The real point of the decision is believed to have been stated in the last paragraph of the opinion, as follows (p. 552):

> "We conclude that Butler's effort, by the use of a combination claim, **to extend the monopoly of his invention** of an improved form of chuck or coupler **to old parts or elements** having no new function when operated in connection with the coupler renders the claim void." (Emphasis ours.)

Here the patent is criticized because some of its claims include in combination the torch body which is the container for the fuel. We submit that this criticism is unjustified because a new result has been realized to which each of the elements, including the torch body, contributes. This is the first time that these elements were so combined as to produce the accomplished result, which is highly useful and not accomplished by any prior art structure. This fact alone distinguishes the instant cases from the *Lincoln Engineering* case, where the result as well as the combination of elements was old.

No attempt is here being made to extend the monopoly of this invention to the torch body sold separately, or to control the sale of any other element of the combination.

Petitioner although relying on the *Lincoln Engineering* case to defeat the patent does not follow the practice there approved by selling the unpatented torch body or the old open-flame torch.

(d) Cases on Unitary Structures

The cases cited in the Second Circuit opinion on the subject of "unitary structure" are criticized because they relate to accountings for patent infringements. The same rule has been applied in many cases involving questions of validity.

Bates vs. Coe, 98 U. S. 31, 40.
Loom Co. vs. Higgins, 105 U. S. 580, 591.
H. Ward Leonard, Inc., vs. Maxwell Motor Sales Corp., 252 Fed. 584, 593 (C. C. A. 2).
Sachs vs. Hartford Electric Supply Co., 47 Fed. (2d) 743, 748 (C. C. A. 2).

(e) The Cases Are Properly Presented Jointly on the Question of Validity

The opposing briefs suggest an impropriety on our part in presenting these cases jointly on the question of validity of the patent. It is believed that this treatment will not only facilitate the consideration of the cases by counsel and the court, but that it is within the approved practice of this court referred to in *Smith vs. Hall*, 301 U. S. 216, 218-219, and cases therein cited.

We respectfully submit that the decision of the Second Circuit Court of Appeals should be affirmed and those of the Sixth Circuit Court of Appeals should be reversed.

WILBER OWEN,
Solicitor for The Toledo Pressed Steel Company.

SAMUEL E. DARBY, JR.,
Of Counsel.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1938.

No. 166

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Petitioner,

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No. 167

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RESPONDENTS' BRIEF.

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The cases were tried together below.

The Court for the Northern District of Ohio, Western Division (Judge Hahn), held the claims in suit valid and infringed (R. 32).

The Sixth Circuit Court of Appeals on December 7, 1937, reversed the lower Court and held the claims invalid for lack of invention (R. 283).

Petitioner (plaintiff below), then filed in this Court its Petition for Writs of Certiorari in both cases.

The same patent was held invalid in Toledo Pressed Steel Company vs. Montgomery, Ward & Company by the District Court for the Eastern District of New York, and that case is now pending on appeal in the Second Circuit—(Petitioner's Motion to Defer Consideration of Petition for Writ of Certiorari, Page 18).

THE ISSUE.

The Petition for Certiorari, Page 7, states the issue thus—

> "Whether a patentee who 'has added a new and valuable article to the world's utilities,' in order to sustain his patent against the defense of lack of invention, must prove affirmatively an 'effort general to the industry to solve a problem which long defied it' • • • in addition to proving that the patented device (a) promptly superseded older devices in use for similar purposes for many years, (b) is acceptable and largely used in fields not available to the older devices, (c) has resulted in a saving of more than 50% in the cost of operation over the older devices, and (d) that the patent has been recognized by a number of other manufacturers who have taken out licenses thereunder."

More briefly, the issue as stated by the Petitioner is—

> "Whether a patentee • • • in order to sustain his patent against the defense of lack of invention must prove affirmatively 'an effort general to the industry to solve a problem which long defied it' • • •"

Respondents' Definition of the Issue.

Respondents believe the issue is better defined thus—

> • • • Did the Sixth Circuit Court of Appeals in its statement complained of by the Petitioner lay down a rule that a patentee in order to sustain invention must prove affirmatively an "effort general to the industry to solve a problem which long defied it." • • •

We believe Respondents' definition of the issue is supported by the statement on Page 8 of the Petition:

> "REASONS RELIED ON FOR GRANTING THE WRIT.
>
> • • • • •
>
> 2. Because the decision of the Circuit Court of Appeals tends to establish a different rule as to lack of invention in combination claims from that established by this court."

Respondents' definition of the issue is also supported by the statement in Petitioner's Brief, Page 10 that:

> "3. The said court erred in disregarding the presumption of validity arising from the granting of the patent and in placing on the petitioner the burden of affirmatively establishing validity instead of requiring respondents to establish invalidity."

ARGUMENT.

Respondents aver that Petitioner has not stated any issue justifying the grant of a Writ of Certiorari.

I.

The Record shows that the Court of Appeals laid down no rule that a patentee must prove affirmatively an "effort general to the industry to solve a problem which long defied it."

The chief ground for the decision of the Court of Appeals was lack of invention in view of the prior art.

> "Stripped of variations in nomenclature, and in the ingeniously differentiated phrases of counsel in setting forth the claims, the invention is for a burner with a metal guard to protect the flame from air currents and rain. The art is full of illustration and description of metal guards for burners, typical of which are the patents to Almond, No. 193,796; Blake, No. 453,335; Kahn, No. 1,755,527; Heston, No. 270,587, and Hathaway, No. 147,496. The challenge to their pertinence must be repelled. There is sufficient suggestion in a burner guard when it is found in one familiar contrivance to point the way to its use in another. We have often observed that where an art is a specialized development of an older art the offspring is entitled to the previously disclosed useful characteristics of the ancestral estate. *Dunham Co.* v. *Cobb*, 19 Fed. (2d) 328; *Page Steel & Wire Co.* v. *Smith Bros. Hardware Co.*, 64 Fed. (2d) 512. A mere change in environment is not patentable unless invention may be found in the concept of the adaptation. *Willett Mfg. Co.* v. *Root Spring Scraper Co.*, 35 Fed. (2d) 858 (C. C. A. 6). In *Lakewood Engineering Co.* v. *Walker*, 23 Fed. (2d) 623, invention was found in the adaption of an element from a wholly unrelated art where differences in size, weight, strength, purpose and manner of use were such

that no effective suggestion could have been furnished by the old device. Even there the question was recognized as close, and we have indicated that beyond that we ought not to go. *Page Steel & Wire Co.* v. *Smith, supra.*" (R. 285.)

Thus it appears that the claims involved were held invalid on the ground that they involve no inventive advance over the disclosures of prior patents.

The absence of any showing of "an effort general to the industry to solve a problem" was only one fact considered by the Court, and was not the fact upon which invalidity was found.

The Statement in the Decree on which Petitioner urges a review here was made by the Court of Appeals in discussing Petitioner's (plaintiff's) argument that commercial success was persuasive of invention in spite of the showing in the prior patents.

"Once again support for validity is sought in demonstration of commercial success. We have seen that the plaintiff was already a successful manufacturer of open flame flares and torches before the alleged invention was made, extensively advertised as possessing the identical virtues of the device of the patent. Acceptance of licenses where royalty is relatively insignificant does not of itself establish patent validity, *Firestone Tire & Rubber Co.* v. *U. S. Rubber Co.*, 79 Fed (2d) 948, since as against strong manufacturers competitors frequently find it more expedient to yield to the claims of a doubtful patent than to undertake the expense and trouble of patent litigation. There is here no substantial evidence of effort general to the industry to solve a problem which long defied it. The proof is limited to experiments of the patentees, and so far as it goes it serves to demonstrate lack of awareness of the teachings of the art rather than the inherent difficulties of the problem itself. They chose the long road to solution, and the patent law does not reward mere persistence, unassociated with original creative effort." (R. 286).

The quoted portions of the opinion of the Court of Appeals show that the Court found that the patent involved no invention over the prior art.

Next the Court gave consideration to the plaintiff's effort to sustain validity by a showing of commercial success and incidental to that consideration made the statement upon which Petitioner relies.

It thus appears that there is nothing in the Decree laying down any rule that a plaintiff must sustain validity by affirmatively showing "an effort general to the industry to solve a problem."

II.

The quoted statement in the Decree is true,—to-wit that "There is here no substantial evidence of effort general to the industry to solve a problem which long defied it." (R. 286.)

Petitioner does not question the truth of this statement, but asserts that it laid down a rule that a patentee must prove such "effort general" in order to sustain the validity of h[illegible] patent.

III.

The absence of "• • • effort general to the industry to solve a problem • • •" is a fact proper to be considered as bearing on the question of invention.

So far as we know, it has always been the accepted rule that where absence of novelty, and consequently absence of invention, appears, no showing of commercial success can give validity to a patent.

Duer v. *Corbin Cabinet Lock Co.*, 149 U. S. 216, 13 S. Ct. 850.

(Syllabus, second paragraph).

> "2. In view of this want of novelty, the fact that the Orum lock went into immediate, extended, and increasing use, while the prior locks were not commercially successful, will not avail to save the patent."

The Court of Appeals gave consideration to Petitioner's (plaintiff's) argument upon commercial success, and in connection with that consideration, it properly noted that there was no proof of effort general to the industry to solve a problem.

Such absence of effort and failure of proof are proper to be considered under such circumstances, as has been clearly indicated by this Court.

In *Paramount Publix Theatres, Inc.* v. *American Tri-Ergon Corporation*, 295 U. S. 464 at 474, 55 S. Ct. 449 at 454, this Court recognized the propriety of considering such facts and said:

> "Evidence of great utility of a method or device, it is true, may in some circumstances be accepted as evidence of invention. Where the method or device satisfies an old and recognized want, invention is to be inferred, rather than the exercise of mechanical skill. For mere skill of the art would normally have been called into action by the generally known want."
>
> • • • • •
>
> "But the state of the motion picture art, as it is disclosed by the present record, indicates that there was no generally recognized demand for any type of film record, for the reproduction of sound to accompany motion pictures, until after the present patent was applied for. See *Hollister* v. *Benedict & Burnham Mfg. Co.*, 113 U. S. 59, 73, 5 S. Ct. 717, 28 L. Ed. 901."

It thus appears that the Court of Appeals in that portion of its opinion complained of by the Petitioner did not "establish a different rule as to lack of invention in combination claims from that established by this Court" as urged in the Petition, Page 8, Reason 2.

Respondents therefore respectfully ask that the Petition for Writs of Certiorari be denied.

STANDARD PARTS, INC.,
and
HUEBNER SUPPLY COMPANY,
Respondents.

By BAIR & FREEMAN,
HOLLOWAY, PEPPERS & ROMANOFF,
Their Attorneys.

W. P. BAIR,
Of Counsel.
Chicago, Illinois.

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CHARLES ELMORE CROPLEY
CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, 1938.

No. 166

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Respondent.

RESPONDENTS' BRIEF.

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RESPONDENTS' BRIEF.

PRELIMINARY STATEMENT OF FACTS.

These are suits for infringement of Patent No. 1,732,708 on a Burner for bomb type torches (flares) used as warning signals on highways and construction jobs.

The plaintiff (Petitioner here) filed two suits in the

Northern District of Ohio,—one against Standard Parts Inc. (October Term, 1938, No. 166 here), involving the "Belser" torch (or flare) and one against the Huebner Supply Company (October Term, 1938, No. 167 here) involving the "Kari-Keen" torch.

The cases were tried together in the Courts below.

In the District Court, the late Judge Hahn held the claims in suit valid and infringed (R. 32).

The Sixth Circuit Court of Appeals on December 7, 1937 reversed the lower Court by a unanimous decision and held the claims invalid for lack of invention—(93 Fed. (2d) 336).

Petitioner then filed Petitions for Writs of Certiorari and Motions to defer consideration. On October 10, 1938 both Motions were denied.

On November 7, 1938, in *Toledo Pressed Steel Company* v. *Montgomery, Ward & Company*, the Circuit Court of Appeals for the Second Circuit by a majority held the patent valid,—(99 Fed. (2d) 806). That cause is now pending in this Court upon Petition for Writ of Certiorari to the Second Circuit Court of Appeals,—*Montgomery, Ward & Company* v. *Toledo Pressed Steel*, No. 603.

Thereupon Petitioner filed a Petition for Rehearing on its Petitions for Writs of Certiorari in the instant cases, setting up the decision of the Second Circuit Court of Appeals and on November 21, 1938, its Petitions for Writs of Certiorari were granted.

Claims 2, 5, 11 and 12 were involved in each of the three cases. In No. 166, Petitioner relies on Claims 2, 5, 11, 12 and 13 and in No. 167 on Claims 1, 2, 5, 6, 7, 11, 12 and 13 (R. 49).

JURISDICTION.

Jurisdiction is based on

28 U. S. Code, Section 347

and on diversity of decisions as to the validity of the patent in the Sixth and Second Circuits.

ISSUES.

Is the Patent Valid?

Is the Patent Infringed?

Outline of Argument.

Invalidity.

The patent in suit is invalid because it involves no invention.

The device of the patent in suit consists of a hollow bomb-shaped body to receive fuel,
a wick tube in the top of the body, and
a cap to protect the flame, imperforate at the top and provided with flame outlet openings and air inlet openings.

The claims in suit are very similar.

Claims 6, 7, 11, 12 and 13 include a flange (called "disc" in Claim 7).

The alleged invention consists in putting an old flame protecting cap on an old torch.

The patentees manufactured the old torch which was the same as that of the patent. Desiring to protect the flame,

they put a cap over the exposed portion of the wick and provided it with air inlet holes and flame and smoke outlet holes.

Caps to protect the flame were readily available in the art of burners.

For instance in patents to

Billingham, No. 181,031.

Almond, No. 193,796.

Almond is a complete anticipation of all of the claims in suit.

Blake, No. 453,335.

Heston, No. 270,587.

Reekie, No. 192,130.

Kahn, No. 1,175,527.

The Withrow and Close experiments prove nothing. They could have been avoided by casual inspection of the available art.

If the patentees made an invention, it is not in the claims in suit.

Infringement.

There is no infringement if the claims be interpreted to cover the only advance in the art made by Withrow and Close.

ARGUMENT.

The Patent Is Invalid Because It Involves No Invention.

The Device of the Patent in Suit.

The Withrow and Close patent is found at Page 156 of the Record.

So far as the claims in issue are concerned, the patented structure consists of

A (bomb-shaped) body
(to receive kerosene)
a wick tube
in the top of the body, and
a cap
(to protect the flame)
imperforate at the top,
provided with flame outlet openings
and air inlet openings.

This is the device of Claim 1, except that the parts in brackets have been added for clarity.

The patentees use different names for the cap. Claims 1, 2, 6, 7, 12 and 13 call it a cap. Claim 5 calls it a guard and Claim 11 calls it a "means for enclosing a space".

Claim 2 is the same, omitting the wick tube.

Claim 5 is like Claim 1, except that it calls the wick tube a—"means to hold the wick in place",

Claim 6 is like Claim 1 with the addition of

"an outwardly extending flange in the region of the wick opening"

to which the cap is connected.

Claim 6 provides that the wick tube extends

"inside of the torch body".

We think this limitation immaterial. Petitioner may think it is. Claim 6 is not urged against the Bolser torch. The wick tube of Bolser does not extend

"inside"

the body.

Claim 7 is like Claim 6, with the "flange" defined as on the wick "tube".

Claim 11 is for a

"burner"

with a wick tube,

"a supporting and heating receiving flange",

and a cap (means) with lateral flame opening and "restricted" air inlet opening.

Claim 12, is like Claim 11,—the cap being in heat conducting relation to the flange.

Claim 13 is like Claim 12 with the flame opening

"even with the top of the wick"

and the air inlet

"lower than the flame opening and above the lower edge of the cap".

There is very little difference in the essence of the claims.

The alleged invention consisted in putting an old flame protecting cap on an old torch.

Both parts do what they always did.

This litigation is an interesting illustration of how by the skill of advocacy, so simple a thing can be given the appearance of importance.

To make the device of the patent, comprising the torch body, the wick tube and the cap, involved only a moderate exercise of mechanical skill.

Withrow and Close are officers of Petitioner.

The Patentees Were Manufacturing Torches With Exposed Wicks for Which They Claimed All the Advantages of the Torches of the Patent.

For awhile they made for McCloskey the torch of his patent, No. 1,610,301 (Testimony of Close, R. 77, bottom). That torch is illustrated in plaintiff's Exhibit 25, R. 204, and in the McCloskey patent, R. 279.

That had a bomb-shaped body 1, a wick tube 8, and a bushing 7, by which the wick tube was held in place in the body.

Close was the patentee of a similar torch, Patent No. 1,613,819, R. 281.

They manufactured a torch quite similar to that of the Close patent (Testimony of Withrow, R. 52) which is shown in Exhibit 4, R. 164.

They claimed for these torches they then made, the same advantages in withstanding wind and rain they now assert for the torch of the patent in suit.

The torch was sold as an

> "open flame warning signal for use at night on all street and highway obstructions" (R. 164).

Petitioner advertised that its torch of Exhibit 4, which it sold for some years before it put out the device of the patent in suit, would burn for 16 hours

> "in wet or windy weather and if the weather is mild, it will last about 30 hours by adjustment of the wick". (R. 164, next to the bottom paragraph.)
>
> "We never had one blow out. • • •" Testimonial, Petitioner's Circular Ex. O, R. 282.
>
> "The large wick assures a vigorous flame which withstands wind and rain." (R. 166.)
>
> "The secret of all weather dependability." (R. 170. Ex. 8.)

While the patentees then held out to the public that their torches were the

"secret of all weather dependability",

they now declare to the Court that they were receiving complaints from users of the torches.

Plaintiff's Exhibit 5 is a package of complaint letters. Extracts from these letters were read into the Record, pages 52-56. The extracts show that most of the complaints were that the torches were put out by wind and rain.

Patentees' Problem.

It therefore became the patentees' problem to provide means for protecting the flame, so that it would not go out in wind or rain.

What they did was to put a cap, like a small inverted tin can, over the wick, and cut holes in the cap to admit air and cut other holes to emit flame and smoke.

This was the sum total of their creation.

They did the perfectly natural and obvious thing. They wanted a flame protector for a torch subject to contractors' rough usage. They put on a metal cap and provided it with air holes and outlet holes, as had always been done with flame protectors.

To put on this cap required no invention.

Caps to Protect the Flame Were Readily Available in the Art of Burners.

The lamp and burner art was a well filled one.

The torch body with the wick tube was in their hands.

Had they looked around among the lamps and burners of the prior art, they would have found any number of hoods and caps and chimneys adapted to protect the flame from wind and rain.

They would have found in every old kerosene lamp a glass chimney for wind protection set on a burner that had air inlet holes. The chimney was open at the top to let products of combustion out.

Billingham Patent, No. 181,031.

The Billingham patent, No. 181,031, of 1876 (R. 235) shows a wick type torch with a tube-like metal cap D screwed onto the torch body. This cap D has "perforations *d*" in its lower part, which the patentee says

> "are intended to allow air to be supplied to the flame to support combustion" (P. 1, col. 2).

The cap D has in its upper part

"perforations *h*"

and the flame issues therefrom. (P. 2, Col. 1.)

The cap D has an imperforate top J below which is a flame deflecting disc *i*, which

> "prevent the extinguishment of the same from rain or other causes." (P. 1, Col. 2.)

Here was the torch body B with a wick tube *c* in the top, and a metal flame protector with air inlet holes and flame outlet holes.

Petitioner urges that the Billingham structure was such as to keep the flame inside. If that is true, then Petitioner's alleged invention consisted in making the cap shorter so the flame would be certain to emerge.

This was not much in view of Billingham's repeated suggestions that the torch did emit flame. (P. 1, Col. 2, line 16 from bottom; P. 2, Col. 1, line 8.)

Almond Patent, No. 193,796.

The Almond patent, No. 193,796 of 1877 (R. 241) meets every claim in issue.

Almond's lamp was intended for heating.

So he provided an outer perforated tube G to retain heat and upstanding brackets J to support a cooking vessel. On removing the tube G the lamp becomes an illuminating one.

Following this brief, in an appendix, is a photostat of the structure of Figure 1 of Almond with the tube G and the brackets J omitted, and without showing the flame as in the Almond patent.

The Almond device has a body A with a wick tube B in the top. Surrounding the tube is a disc-like block E, not here material.

On the upper end of the wick tube B is a cap made up of several parts. We assume that the fact that this cap has several parts instead of one part is immaterial.

The cap is composed of the disc-like flange or plate F supported on a sleeve-like tube D, and provided with a peripheral

> "upwardly projecting rim, *b*" (P. 1, Col. 1, line 4 from bottom) (R. 242).

Resting on the rim *b* is a tube H (P. 1, Col. 2, lines 21-27).

The upper end of the tube H is closed by an imperforate top (cap) I (P. 1, Col. 2, lines 31-32).

The perforations in the "rim" *b* are air inlets (P. 1, Col. 2, line 8 from bottom).

The tube H

> "is perforated with holes of considerably larger diameter than the holes of the " " " rim *b*". (P. 1, Col. 2, lines 27-30.)

When the flame is low, it is confined within the tube H (P. 1, Col. 2, last paragraph.) When the flame is larger, it also burns outside the tube H of the cap. (P. 2, Col. 1.)

In Almond is everything that is in the claims in suit.

Almond—Applied to Claim 1.

May we now compare the Almond structure, as shown in the picture in the appendix hereto, with Claim 1 of the patent in suit.

Withrow and Close Claim 1	Almond
A torch body having an opening in its upper end	A
a wick receiving tube extending into said opening	B
a cap disposed on the outer side of said torch body to enclose the outer end of the wick	F-H-I
having an imperforate upper wall	top of I
lateral flame openings	holes in H
air openings below the flame openings	holes in *b*, the "rim" on F.

We note here that Petitioner cannot differentiate from Almond by urging that Almond's cap is not "disposed on the outer side of said torch body" (secured to the torch body) as in the patent in suit, because the accused device is like Almond in that its cap is on the wick tube above the torch body. (See Kari-Keen torch in second drawing in appendix.)

Either the claim defines that structure or there is no infringement.

Claims 2 and 5.

Almond meets Claims 2 and 5 similarly.

Claim 6 (urged only against Kari-Keen).

It meets Claim 6 which calls for the flange to which the cap is secured.

In order for the claim to cover the Kari-Keen torch

against which it is urged, that flange must be the bottom of the cap in Kari-Keen or the flange at the wick opening in Kari-Keen.

In its argument in the Sixth Circuit Court of Appeals, Petitioner said Kari-Keen had both and was therefore an infringer.

Petitioner was there a little hard put, because the upper flange (Kari-Keen's cap bottom) is not

"in the region of the wick opening"

as called for by the claim and the lower flange is not

"connected"

to the cap, as called for by the claim.

But in any event, Almond has both.

Almond has the cap bottom F like Kari-Keen and the

"lower flange"

so marked in the drawing following this brief.

Therefore Almond has the Kari-Keen arrangement whatever Petitioner's theory may be, and anticipates the claim.

Claim 7.

This is urged only against the Kari-Keen torch.

So far as we can recall, Petitioner has never attempted to specifically apply Claim 7 to the Kari-Keen flare (torch).

The claim calls for

"a disc adapted to embrace the wick, and having a flanged upper portion disposed in the region of said air ports".

These are the lower air ports.

We believe this is the

"disc 11a provided with an upwardly extending flange" (P. 2, line 11 of the patent)

shown in Figure 3.

The upwardly extending flange is the upper part of the wick tube.

If it is found in Kari-Keen, it is the wick tube itself ("flange" of the claim) (see drawing in appendix) with one of the flanges at the wick opening ("disc" of the claim).

So likewise is it the wick tube and "lower flange" of Almond, and Almond is a complete anticipation.

Claim 11.

Claim 11	Almond
A wick holder having a portion in contact with the wick	B
and a supporting and heat receiving flange	lower flange *or* cap bottom
means enclosing a space above said flange	*b*-H-I
except for the provision for lateral exit of flame and	holes in H
restricted entrance of air for combustion	holes in *b*

Claim 12.

Claim 12	Almond
A wick holder, having a portion in contact with the wick	B
and a lateral flange	F
a cap enclosing and spaced from the wick	*b*-H-I
having an imperforate top	top of I
and provision for lateral exit of flame	holes in H
and entrance of air	holes in *b*
the bottom of the cap being in heat conducting relation to said flange	the lower edge of *b* is integral with F

Claim 13.

Claim 13	Almond
A wick holder having a portion in contact with the wick and a laterally extending flange	B F
a cap over the wick having an imperforate dome-shaped top wall	*b*-H-I I
a lateral flame opening approximately even with the top of the wick	hole in H
a smaller opening for the inlet of air lower than the flame opening and above the lower edge of the cap	hole in *b*
said lower edge being in heat transferring relation to said flange	*b* and F

These claims read directly on Almond.

Petitioner's Attack Does Not Meet Almond

Petitioner urges that Almond would not function as an outdoor flare. This was Mr. Withrow's opinion (R. 132-133). He thought it would blow out and burn with a blue flame and with two flames.

Defendants operated a burner like Almond's with slightly different holes (Ex. G) and it burned just the same as the others (R. 96).

Petitioner's Brief, Page 19, calls attention to the Withrow and Close testimony that Almond's burner would not stay lighted in a moderate wind, and states that there is no evidence to the contrary.

This statement is incorrect as may be seen from the foregoing reference to Page 96 of the record.

Petitioner suggests in its Brief, Page 18, that Almond guarded against heating the wick and the fuel therein.

This statement is erroneous. What Almond did was to guard against overheating of the fuel chamber. Almond does in the last full paragraph on Page 1 of his specification say that he uses the wooden block E and that it and the tube D are covered by asbestos paper. However, he also says in the next sentence that the tube D terminates in a flange F. This flange F forms the bottom of Almond's cap and is in direct conducting relation with the cap, and, of course, with the tube D of which it forms a part and with the wick tube B surrounded by tube D. It must necessarily follow that if the cap gets hot, the wick tube gets hot.

Other Prior Patents.

Suppose we consider Withrow and Close as the traditional men skilled in the art, seeking to find a flame protector for a bomb-type torch.

If they want to go further than Billingham and Almond, they might look at

Blake, *et al.*, No. 453,335, 1891 (R. 247).

Blake shows a vapor burner. It uses a wick to convey the fuel to a point where the fuel is heated and then it burns the vapor but does not burn the wick.

The patentees recognize the desirability of protecting the flame, and so they say, page 2, line 78 of the patent specification:

> "It will be apparent that the slight flame formed when the valve D is closed * * * would be liable to be extinguished by drafts of air, and also that the large flame might be rendered unsteady and might be extinguished at some of the orifices momentarily by, air-blasts accidentally directed upon it if no protection were afforded for the flame. To afford such protection is the purpose of the shield C. This shield has the bottom C' perforated, as already described,

the intention being to admit an abundant supply of air to the flame, but to so thoroughly break it up that it shall be distributed evenly and not at any time reduced to a blast at any one point. The shield entirely encircles the burner-tip and is closed at the top, and has the apertures *c*2, which are radially in line with the apertures *b*3 in the burner tip B. The apertures *c*2 however are very much larger than the orifices *b*3, " " "".

Here is the cap of the patent.

Blake mentions the need for a protector and suggests a metal cap C with a closed top and with flame holes in the sides of the cap and air inlet holes in the bottom.

We note that the members B^4-B^6 of Blake form a cross and do not close the bottom of the cap.

Here then is a cap to fit over the wick tube or the burner tip and to allow the inlet of air and exit of flame.

When the patentees wanted a flame protector, all they needed to do was to read the Blake patent.

Blake showed an "Illuminating Burner", (P. 1, line 7) Therefore he must have intended the flame to emerge from the cap.

Let us assume that the Petitioner or anyone else interested in the problem of finding a wind and rain protector wanted to go a little farther than the Blake patent into the study of the art.

It would not take much investigation to find the patent to Heston, No. 270,587, R. 244.

This shows a gas burner in which the gas is fed upwardly through a tube R to a double walled cap B-C. There are holes in the walls and one wall is rotatable with relation to the other to control the passage of vapor through these holes.

The man who wanted a cap to protect a flame could glance at the Heston patent and find it.

A little further investigation discloses the patent to

Reekie, No. 192,130, R. 239,

showing a vapor burner of the wick type with a burner D, in the form of a hollow metal cap having an imperforate top and flame outlet holes near the top and air inlet holes near the lower part.

The patentee explains that the top of this cap is a flame deflector, that the gas issues into the core F (the lower part of the cap)

> "where the air inlets are located and where the gas is ignited and rising therein finds an exit beneath the deflector • • •"

It certainly would require only a modest amount of skill to find here a cap that would be a wind and rain protector.

However, a workman who was even careful, though not an inventive genius, might go a step farther in looking around to see what was available, and he would find the patent to

Kahn, No. 1,175,527, R. 260,

which discloses a burner for which the inventor provides

"hood elements".

He calls his burner a "head", and says that the hood elements

> *"are designed to encase any type of head* • • •"
> (Specification, page 1, line 77). (Emphasis ours.)

Kahn's hood is a hollow sheet metal cap with an imperforate top and with holes in the upper part of the side wall, holes in the lower part of the side wall, and holes in the bottom.

Here is the device of the Withrow and Close patent claims.

Illustrations of Art Available to Withrow and Close.

Following this brief in the Appendix, there is inserted a sheet entitled "McCloskey Torch with Caps from the Art", in which we have shown the McCloskey torch body with the caps of Almond, Blake, Reekie, Heston and Kahn. The torch is shown in yellow, the wick tube and flange in purple and the cap in pink.

In the upper row of figures, we have shown the various caps set down on the torch body, because this is the way the patentees mounted their cap on the torch body.

In the lower row, we have shown the caps mounted on the wick tube above the torch body, because this is the way the defendants mount their caps.

We beg the Court's indulgence in glancing for the moment at these drawings. They are on the second sheet following the brief.

It certainly took no degree of inventive genius to mount any of these caps on the McCloskey torch to provide protection from the wind and the rain.

There was no need for all the elaborate set of experiments which the patentees made. They would have gone faster had they opened their eyes and used the available art than they did by closing their eyes to the available art, and working out their own various forms of caps.

When they added any one of the caps from the prior art to the McCloskey torch, as shown on the drawing mentioned, they had the answer to their problem.

It may be that there would then be necessary some investigation to determine the right sizes for the holes for the air and the flame. To determine these sizes is certainly merely a matter of experiment.

The patent in suit does not explain what the sizes

should be, except to show that the flame holes are larger than the air holes. It affords no rule or formula, for finding sizes or proportions.

The Flange of Withrow and Close Was No Invention.

Petitioner emphasizes this flange, as a means whereby heat is conducted to the wick tube from the cap to cause the fuel to be heated till it forms a gas.

But the use of such a flange was no *invention*.

Once having decided to put a flame protecting cap on the McCloskey type torch, it was almost impossible to do it without having a flange that would serve as a heat conductor.

If one fastens the cap to McCloskey's collar in which the wick tube is mounted, the flange of the collar is a heat conductor.

If one sets a cap like Almond's or Blake's on the wick tube, the bottom of the cap is a flange which conducts heat.

The fact that the flange conducted heat was no discovery of Withrow and Close.

In the patent to Knowles, No. 22,771, issued in 1859 (R. 263) on a lamp, the inventor sought to provide means to reduce the burning (*carbonizing*) of the wick (P. 1, lines 18-27). He discloses a body to hold fuel, a wick tube *c* and a cap *i*, and a flange (deflector *f*, Page 1, line 66). The cap, which he calls another deflector, has air inlet holes *k* (Page 1, line 106), and a flame outlet hole in the top.

This structure reads on the claims in suit, except only that the flame hole is in the top instead of the side of the cap.

Knowles recognized the heating effect of the cap *i* and flange *f*.

He says that this cap and deflector form a chamber surrounding the lower part of the flame (that part in the cap)

> "so that the heat given out by this part of the flame heats the lower diaphragm deflector, which by conduction heats the chamber (g) below • • •"

Withrow and Close discovered nothing, either in the structure, or the functioning of the caps they used.

The McCloskey torch with a cap from the prior art has all the advantages of the Petitioner's torch.

It protects the flame against wind and rain.

That was the purpose of the Blake cap (No. 453,335, 1891, R. 247).

The cap heats the wick tube. It must do so if it gets hot.

It thus saves the wick, and gives the "economy" claimed for the Petitioner's torch.

Petitioner's Small Protected Combustion Chamber.

On Pages 23 and 24 of Petitioner's Brief is reference to the testimony of Olsen.

Counsel say Olsen

> "found a small protected combustion chamber in the bottom of the cap • • •"

If he means the space below the air inlet holes, it is obvious that no combustion occurs in the dead air space there.

Incidentally the Bolser torch, see drawing in Appendix, has no such space below the inlet holes, and if the claims are limited to it, Bolser does not infringe.

Withrow and Close Experiments Prove Nothing.

To meet the problem, the patentees say they started in the experimental route. They tried out various kinds of hoods and caps and finally hit on the one of their patent (R. 60).

Petitioner urges that the number of these experiments shows the difficulty of the problem and indicates invention.

Respondents suggest that the patentees simply went at their job in the slowest and most awkward way.

Had they looked to the readily available art, the experiments would have been unnecessary, because the answer to the problem was before them in the simplest form.

The fact that the patentees made numerous experiments to find a proper cap for their flare is no proof of invention, because there was no need for such experiments and the answer to their problem was readily available in the prior art.

Commercial Success.

Petitioner urges commercial success to show invention. We believe absence of invention is clear. Where that is true, commercial success can neither create nor dissolve a doubt.

John T. Riddell, Inc. v. *Athletic Shoe Co.*, 75 Fed. (2d) 93 at 95 (7th C. C. A.).

If Patentees Made an Invention, It Is Not in the Claims in Suit.

Referring to Claim 14 of the patent in suit, not in issue, and to Figure 3 of the patent in suit, it will be observed that Withrow and Close provided a peculiar collar 3a (called a "flange member", Page 2, line 16), one end of which screws into the top of the torch body and which is provided with an annular horizontal shoulder and an upstanding internally threaded part or flange.

The wick tube is made in two parts and has flanges 5a and 11a. The flange 5a rests on the shoulder of the member 3a. The cap 7 then screws into the member 3a and fits down on the flange 5a and thus locks the wick tube flanges in place.

Whether or not this particular arrangement constitutes an invention, we do not say, but it discloses the only advance made by Withrow and Close over the art, and it is *not the structure defined in the claims in issue.*

It should be borne in mind that we have heretofore treated the claims in issue as the Petitioner treats them and have given them that interpretation which Petitioner gives them in order to read them on the accused structures.

Infringement.

There is no infringement of any of the claims in issue if these claims be interpreted to cover the Withrow and Close structure just mentioned above, in which the flange on the wick tube is locked in place when the cap is screwed onto the body.

The Bolser and Kari-Keen burners do not embody that feature.

The Bolser Burner.

In the long sheet of drawings in the appendix, we have shown the Petitioner's burner and the Bolser burner.

It will be observed that in the Bolser burner, the cap has a reduced sleeve which slips down over the wick tube and there is no direct connection of the wick tube with the torch body, nor is there any arrangement by which the mounting of the burner cap on the torch body serves to hold the wick tube in place.

The Kari-Keen Burner.

Similarly in the Kari-Keen burner, the cap has a reduced portion mounted on the upper end of the wick tube and the cap is not mounted on the burner body directly nor does the mounting of the cap in any way function to hold the wick tube in place.

Therefore if the claims in suit be interpreted to cover the Withrow and Close sole contribution in which the cap screws into the member on the torch body and thereby holds the wick tube in place, then there is no infringement.

If the Supreme Court Should Affirm the Decision of the Second Circuit Court of Appeals on the Theory Followed by That Court, Still the Supreme Court Should Not Reverse the Instant Cases.

There is no real conflict in decision between the Sixth Circuit Court of Appeals and the Second Circuit Court of Appeals.

We do not purport to say what evidence was in the Second Circuit case, but the decision of the Court of Appeals of that Circuit seems to have turned upon evidence which the Court said was not in the record in the Sixth Circuit case.

Toledo Pressed Steel Co. v. *Montgomery Ward & Company*, 99 Fed. (2d) 806 at 807.

> "This record, however, contains evidence absent in the Standard Parts case, showing that the art was in search for this accomplishment."

and at Page 808:

> "That the problem required more than mechanical skill is demonstrated by the evidence and trials of those interested in its solution."

We respectfully submit that the decisions in these cases should not be reversed on account of evidence in the Second Circuit case, which these Respondents have never had an opportunity to meet.

Conclusion.

The device of the claims in suit is a very simple one.

It consists of an old torch body, having thereon an old flame protecting cap.

To place this cap on the torch body was all that defendant did and this did not arise to the dignity of an invention.

The decree below should be affirmed.

Respectfully,

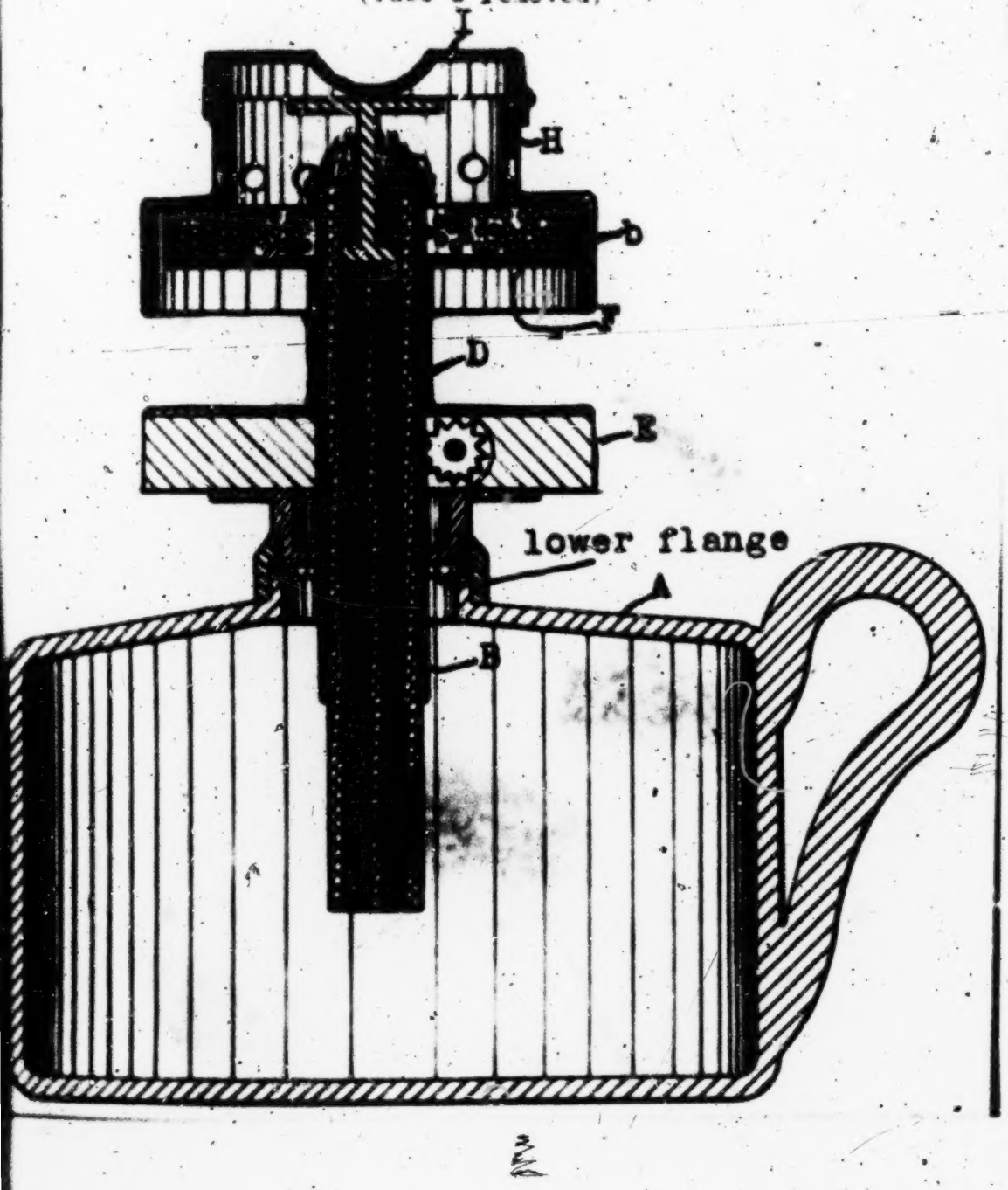
STANDARD PARTS, INC.,
and
HUEBNER SUPPLY COMPANY,
Respondents.

By BAIR & FREEMAN,
Their Attorneys.

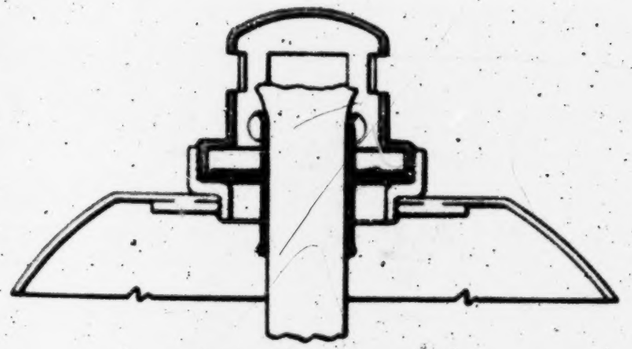
W. P. BAIR,
Of Counsel.
Chicago, Illinois.

Part of Fig. 1 - Almond 138,796

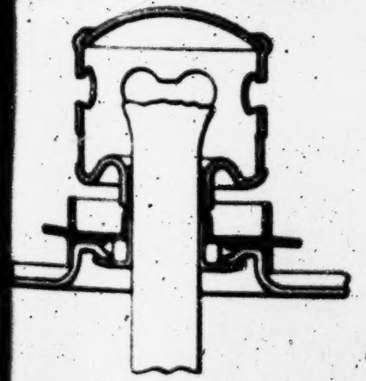
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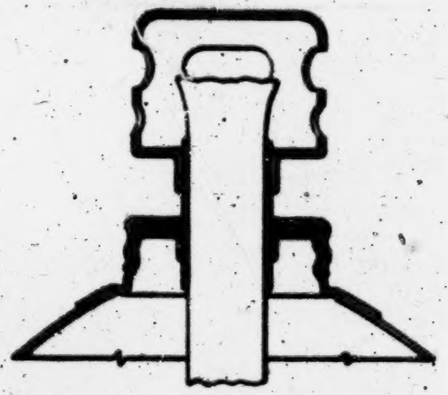
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PLAINTIFF'S BURNER

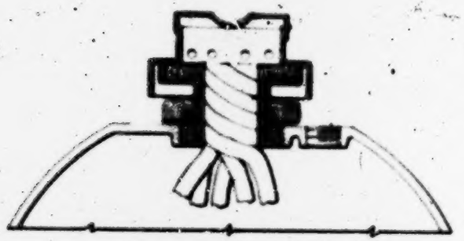


BOLSER BURNER

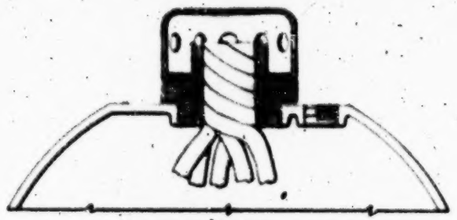


KARI-KEEN BURNER

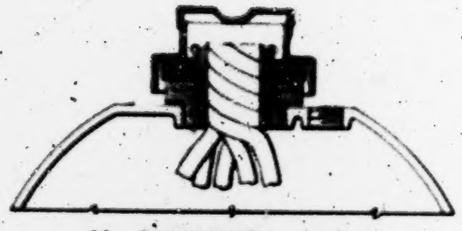
Mc CLOSKEY'S TORCH



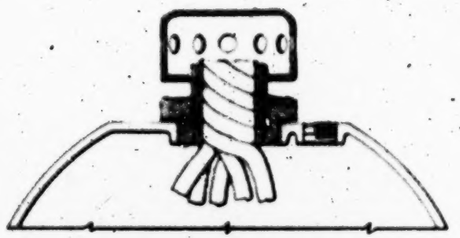
Mc CLOSKEY'S TORCH
ALMOND'S CAP



Mc CLOSKEY'S TORCH
BLAKE ET AL's CAP

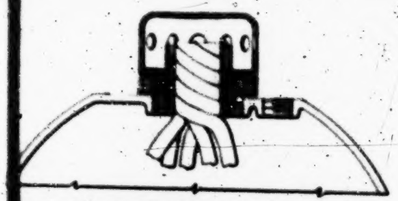


Mc CLOSKEY'S TORCH
ALMOND'S CAP

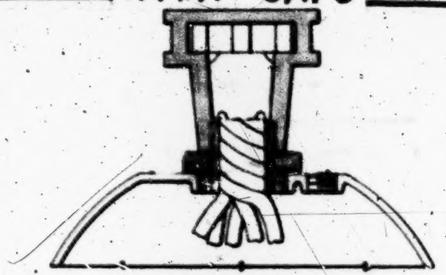


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BLAKE ET AL's CAP

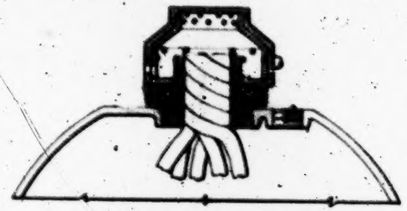
TORCH WITH CAPS FROM THE PRIOR ART



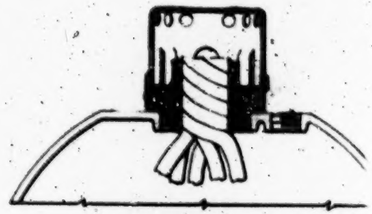
Mc CLOSKEY'S TORCH
BLAKE ET AL'S CAP



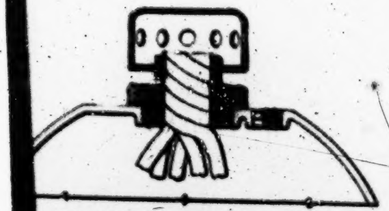
Mc CLOSKEY'S TORCH
REEKE'S CAP



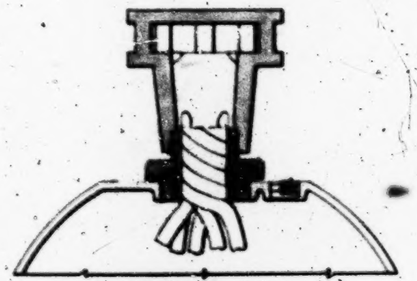
Mc CLOSKEY'S TORCH
WESTON'S CAP



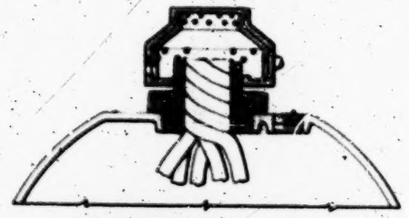
Mc CLOSKEY'S TORCH
KAHN'S CAP



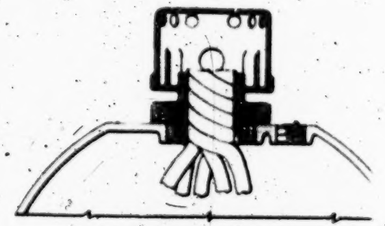
Mc CLOSKEY'S TORCH
BLAKE ET AL'S CAP



Mc CLOSKEY'S TORCH
REEKE'S CAP



Mc CLOSKEY'S TORCH
WESTON'S CAP



Mc CLOSKEY'S TORCH
KAHN'S CAP

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CLERK

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1938

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

STANDARD PARTS, INC.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

HUEBNER SUPPLY COMPANY.

ON PETITION FOR WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE ~~SECOND~~ SIXTH CIRCUIT.

PETITION FOR REHEARING AND SUPPLEMENT THERETO.

WILBER OWEN,
Counsel for Petitioner.

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the Second Circuit in an action in equity for infringement of the same United States Letters Patent of petitioner as here involved, in which petitioner is plaintiff-appellant and Montgomery Ward & Co., Inc., is defendant-appellee.

The motion to defer consideration also was denied on October 10, 1938.

On October 14, 1938, the said appeal in the case of petitioner against Montgomery Ward & Co., Inc., was heard by the United States Circuit Court of Appeals for the Second Circuit. Petitioner is informed and believes that the United States Circuit Court of Appeals will render its decision in that case shortly after the Court reconvenes on November 7, 1938.

The decision of the United States Circuit Court of Appeals for the Sixth Circuit herein sought to be reviewed will become final if this petition for rehearing is denied, since the judgment of the lower court dismissed the bill of complaint.

Should a conflict occur between the decision herein sought to be reviewed and that of the United States Circuit Court of Appeals for the Second Circuit, the petitioner will be in a position to urge an additional reason why certiorari should be granted.

As appears from the affidavit of Carl V. Wisner, Jr., counsel for defendant-appellant in said cause pending in the Second Circuit Court of Appeals, he will file a petition for writ of certiorari in this Court in the event that the decree in the District Court in said cause is reversed, and as appears from the affidavit of Wilber Owen, counsel for plaintiff-appellant in said cause, he will file a petition for writ of certiorari in this Court in the event of conflict between the decision of the Sixth Circuit Court of Appeals in these causes and any decision which the Second Circuit Court of Appeals may render in said cause pending before it.

WHEREFORE petitioner respectfully prays the reconsideration by this Court of its petition for writs of certiorari in these causes. Alternatively, we respectfully request reconsideration of the motion to defer consideration of this petition pending the decision of the United States Circuit Court of Appeals for the Second Circuit.

WILBER OWEN,
Counsel for Petitioner.

I hereby certify that the foregoing petition is presented in good faith and not for delay.

WILBER OWEN.

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1938

No. 166

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

STANDARD PARTS, INC.,
Respondent.

No. 167

THE TOLEDO PRESSED STEEL COMPANY,
Petitioner,

vs.

HUEBNER SUPPLY COMPANY,
Respondent.

SUPPLEMENTAL PETITION FOR REHEARING.

Supplementing the petition for rehearing of its petition for writs of certiorari filed herein on November 4, 1938, petitioner shows to the Court that subsequent to the filing of

said petition for rehearing, to wit on November 7, 1938, the United States Circuit Court of Appeals for the Second Circuit rendered its decision in the case entitled The Toledo Pressed Steel Company, Plaintiff-Appellant, *vs.* Montgomery, Ward & Company, Inc., Defendant-Appellee, finding Withrow and Close Patent No. 1,732,708 valid and infringed by structures sold by said defendant-appellee, Montgomery, Ward & Company, Inc., and reversing the decree of dismissal entered by the District Court in said cause.

As a result of said decision by the Second Circuit Court of Appeals, there now exists conflict of decision on the same matter between the Sixth Circuit Court of Appeals in the above-entitled causes and the Second Circuit Court of Appeals in said Montgomery, Ward & Company, Inc., cause, the Sixth Circuit Court of Appeals having held said patent to be invalid for want of invention and the Second Circuit Court of Appeals having held it to be valid.

A certified copy of the said decision of the Second Circuit Court of Appeals is atttached hereto and filed herewith.

Also attached hereto is the affidavit of Mr. Carl V. Wisner, Jr., Counsel for Montgomery, Ward & Company, Inc., to the effect that, based on the conflict, he intends promptly to apply to this Court for review on writ of certiorari of the said decision of the Second Circuit Court of Appeals.

By granting the petition for writs of certiorari herein, this Court will be in a position to decide the two causes which are now in conflict on the same matter.

WHEREFORE petitioner respectfully prays the reconsideration by this Court of its petition for writs of certiorari in these causes.

WILBER OWEN,
Counsel for Petitioner.

I hereby certify that the foregoing petition is presented in good faith and not for purposes of delay.

WILBUR OWEN.

APPENDIX A.

[Stamp:] Office of the Clerk, Supreme Court, U. S. Nov. 12, 1938.

UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

THE TOLEDO PRESSED STEEL COMPANY, *Plaintiff-Appellant*,

against

MONTGOMERY, WARD & COMPANY, *Defendant-Appellee*.

Before Manton, Swan and Chase, Circuit Judges.

Appeal from the District Court for the Eastern District of New York. Suit by Toledo Pressed Steel Co., plaintiff, against Montgomery, Ward & Company, defendant, for infringement of patent for a burner. Decree for defendant; plaintiff appeals. Reversed.

Darby & Darby, Solicitors for Plaintiff; Samuel E. Darby, Jr., Wilber Owen, of Counsel.

Anthony William Deller, Solicitor for Appellee; Carl Wisner, Jr., of Counsel.

MANTON, *Circuit Judge:*

This suit is for infringement of patent No. 1,732,708 granted October 22, 1929, on an application filed December 26, 1928 for a kerosene burning construction torch. Claims 2, 5, 11 and 12 * are sued on.

---

* 2. In a device of the class described, a torch body having an opening FOR A WICK, AND A FLAME GUARD FOR SAID WICK MOUNTED ON THE outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports.

5. In a device of the class described, a construction torch having an opening in its upper end for a wick, means to hold the wick in place, and a guard fitting over the outer end of the wick but spaced from the

This torch is used as a warning signal on streets to make known obstructions on the highway. The patent states:

> "This invention relates to street torches, such as are commonly used for illuminating road obstructions, and usually referred to as construction torches, but more particularly to devices for increasing the efficiency of such torches and militating against extinguishment of the torch flame, and an object is to provide a simple and efficient attachment for torches of the above character for increasing the efficiency thereof and materially reducing the liability of extinguishment of the flame by high winds. Another object is to provide a burner so constructed and arranged that liability of extinguishment of the flame by high winds or by rain is reduced to a minimum. * * *"

And further:

> "* * * It has been found that with the above described construction and arrangement, the oil consumption is materially decreased. It is also found that the amount of wick used is likewise decreased. Another outstanding advantage resides in reducing the liability of extinguishing the flame by high winds or rain."

Oil consumption by the burner of the patent in suit is reduced more than 50% as compared with its predecessor, the open flame torch; wick consumption which was from three-fourths of an inch to an inch and a quarter each

---

sides thereof, said guard having an imperforate top wall and side flange and air openings.

11. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a supporting and heat-receiving flange, and means enclosing a space above said flange and surrounding the wick, except for provision for lateral exit of flame and restricted entrance of air for combustion.

12. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and lateral flange, and a cap enclosing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange.

sight in the open flame torch was practically eliminated. It is undisputed that appellant and appellee's torches now pass all the tests imposed by the State Highway Departments, none of which are passed by the open flame torch. These advantages are obtained by substituting for the burner of the old open flame torch, which was a wick-tube and wick protruding from the container for oil, a burner in which the end of the wick-tube and wick are enclosed in a metal cap provided with suitable air inlets and flame outlets. The cap is supported on a flange which contacts the wick-tube and transmits heat to the wick-tube and wick to maintain the oil above the flash point and provide under all weather conditions a suitable supply of hydrocarbon vapor which escapes from the flame openings in the metal cap and burns outside the cap. Regardless of the effect of wind and rain on the flame outside the burner, the source of the flame inside the burner is protected and continues to supply the hydrocarbon vapor necessary to feed the flame which is the warning signal.

This patent was litigated in the Sixth Circuit where the Circuit Court of Appeals held it to be invalid. Standard Parts Inc. *v.* Toledo Pressed Steel Co., 93 Fed. 2, 336. The court below felt obliged to follow that decision.

This record, however, contains evidence absent in the Standard Parts case, showing that the art was in search for this accomplishment; that others worked unsuccessfully to solve the problem of producing a torch which would not only be more economical in the use of kerosene, but would remain lighted notwithstanding rain and wind. In the Standard Parts case, it was said that the problem required no inventive thought. The proof here, not found in the Standard Parts case, showed widely separate unsuccessful attempts to provide some means which would prevent the flame from being extinguished. Unsuccessful efforts were made over a long period by men skilled in the art of burners. The history of the art, as here shown, demonstrates that the accomplishment was not easy nor apparent nor merely the work of one skilled in the art. Hookless Fastener Co. *v.* Prentice Mfg. Co., 68 Fed. 2, 940, 941.

The open flame torch had been in use as a warning signal for many years. The usual type was a sheet metal con-

tainer with a wick one and a half inches long; the wick was soaked with kerosene and burned from the sides as well as the top. It was referred to as a "bonfire of cotton fibre". High fuel and wick consumption were the consequence. A strong wind would blow the flame away from the wick and cool the oil below the flash point, thus causing the flame to go out. If water soaked the wick, it would vaporize and cool the wick below the temperature at which the oil would burn and the flame would go out. Moreover, the flame produced was three or four inches in diameter and sometimes six to eight inches high of irregular shape, flickering and weaving from side to side with changing air currents.

The problem presented was to preserve this open unsteady flame and maintain it under all kinds of weather conditions without enclosing it. By the mechanical combination of parts shown in the patent, the results above referred to as to efficiency and economy were obtained. Kerosene gives off no combustible vapors at ordinary temperature, but must be heated to the flash point which runs up to 150° or 160° F. There is a small protected combustion chamber in the bottom of the cap in both appellant's and appellee's devices, provided with restricted air inlets, so that, when lighted, it has a little chamber where a little air is admitted, and which maintains the temperature of the wick to the point where it will give off vapor. The cap temperature was found on test to run as high as 780° F; the heat from the cap was conducted into the flange and into the tube surrounding the wick, and this heat would supplement the heat from the small flame in the combustion zone and would succeed in maintaining the temperature of the wick tube and the kerosene which would be vaporized and keep the flame going. On tests it was found that high wind velocity did not seem to succeed in eliminating the flame or cooling the kerosene as used in both appellant's and appellee's burners. Both acted alike in that respect and both gave high temperature of feed.

That the problem required more than mechanical skill is demonstrated by the efforts and trials of those interested in its solution. The need for the general use of torches became more necessary with the general use of automobiles. The evidence shows that it has been the experience of those

using the open flame torch that it blew out or was rained out and there was a real problem of securing a burner which would stand both rain and wind. Unsuccessful attempts have been made by competitors who had been long in the business of manufacturing and selling open flame torches. The results of these experiments were placed upon the market and, until the burner under the patent in suit appeared, they had not solved the problem. When placed on the market, appellant's burner superseded open flame torches. Other manufacturers of sheet metal open flame torches soon abandoned their makes in favor of the patented type. Some competitors took out licenses under the patent; others brought out torches similar to the patented device and in so doing passed the tests prescribed by State Highway Departments for signal devices. It was only after a series of experiments extending over a long period that the inventor here succeeded. It was the protection of the source of the flame from wind and rain by means of the metal guard provided with suitable openings, thus insuring the maintenance of a small portion of the flame in a protected zone and utilizing the heat from this flame and the heat from the metal guard to maintain the temperature of the kerosene in the wick above the flash point which insured a supply of gaseous vapor at all times which would pass outside the guard and thereby provide the open and unprotected flame which formed the warning signal.

The prior art does not disclose or suggest the combination or result here obtained. The patent to Rutz No. 1,101,146, granted June 23, 1914, had for its object

> "to provide a simple, economical and effective flash igniter for a series of gas stove burners, the same being grouped about the igniter and within the field of entrained jets of flame, which jets are emitted from the igniter under the control of the operator."

This device was used on a kitchen gas range and many of them were sold. The flame they are designed to protect is a small pitol light, which burns continuously and is so feeble that it might be extinguished by indoor drafts, such as the sudden closing of a door. The flame is completely enclosed

within the metal cap. The principle function of this cap is materially different from any function of a burner of the patent in suit. The fuel is not the same. Rutz uses gas under pressure. The patentee here uses kerosene which must be vaporized before it will burn and when vaporized is not under pressure. There is the problem of heating the fuel to vaporize it. Rutz makes provision for cooling the cap by providing a substantial space between the pilot light and the cap walls, also by passing a cylinder of air up through the vent openings in the supporting disk and out through vent openings near the top of the cap, whereas in the patent in suit the heat of the cap is utilized to assist in heating the kerosene in the wick above the flash point. In the Rutz patent there is no means for heating the cap if its use there were desirable. The pilot light is small and so far spaced from the cap that no substantial amount of heat will be transmitted to the cap, even in the absence of the rising cylinder of air inside the cap and along its walls. The flame which follows the jets of gas to the stove burners continues for only a fraction of a second and does not impinge upon the walls of the cap.

Heating the cap is very important in the patent in suit, one of its functions being to supply heat to the wick and the oil in the wick tube so as to raise the oil above the flash point. In the Rutz patent there was no problem of fuel or wick consumption, whereas these were important considerations of the patent in suit. Rutz had no problem of maintaining the flame under conditions of wind and rain.

The Russian patent to Malcoy, No. 1163 of 1868, is for a lamp burner of special construction. The description is meager and the drawing vague and it is justly so criticized. The specifications refer to two tubes and state that between them "there remains a space into which may enter a third tube called regulator and intended for the adjusting of the size of the flame". Apparently it was intended to use charcoal which would become heated above the flash point of the oil and hydrocarbon vapors and would escape through the small perforations in the dome, where they would mix with the air and burn. The experts called were unable to understand the disclosure of this Russian patent. It does not anticipate the patent in suit.

In Rockwood *v.* General Fire Extinguisher Co. (8 Fed. 2, 682, 686), we pointed out that if changes had to be made in the combination cited as in anticipation to make it a successful commercial device, it would not be such prior art as would invalidate a patent. But it is argued that appellant had sought a patent by attempting to obtain a monopoly on a new use for the Rutz structure. It is said that the appellant has attempted to take one element, the guard for the pilot light from the Rutz apparatus, and combine it with a fuel tank wick and wick holder of the prior art in such a manner as to accomplish to some degree the functions and results of the patent in suit. But the device here used as a warning signal—the burner—must be considered as an entirety, that is, the oil container, the wick, the wick tube and the top. Dwight & Lloyd Sintering Co. *v.* Greenawalt, 27 Fed. 2, 823; Traitel Marble Co. *v.* Hungerford Brass & Copper Co., 18 Fed. 2, 66, 68. While torch bodies and flame guards were old, they have never been used together to perform the function or produce the results of the device of the patent in suit. If they were ever combined for any purpose, it was not to protect the flame at its source so as to provide a small protected chamber in which some part of the flame would continue to burn regardless of outside weather conditions, with the greater and visible part of the flame burning as a warning signal outside the guard. This combination and use amounted to invention. Instead of being for a combination of elements whose novelty depends upon an improvement of one of the elements without change of function or result of combination in its entirety, this patent covers a unitary structure patented as an entirety. Westinghouse Electric & Mfg. Co. *v.* Wagner Electric & Mfg. Co., 225 U. S. 604; Elizabeth *v.* Pavement Co., 97 U. S. 126; Stromberg Motor Devices Co. *v.* Zenith-Detroit Corp., 73 Fed. 2, 62.

But defendant says it avoids infringement because in its device the flange which supports the cap is elevated a short distance above the body of the torch and the air inlet openings are located in this supporting flange instead of in the side of the cap. No statement in the claims of specifications requires that the cap rest directly on the body of

the torch, nor that the air inlet ports be located in the body of the cap. The patentees state that while they have shown and described the constructions "which admirably fulfill the objects primarily enumerated, it is to be understood that the above description * * * is given by way of illustration and not of limitation."

Claim 2 calls for a "flame guard for said wick mounted on the outside of the said torch body, said guard including * * * air ports." In Appellee's device the flame guard is mounted on the outside of the torch body. There is no doubt that the flame guard includes both the cap and its supporting flange and that the flame guard includes air ports.

Claim 5 calls for "a guard fitting over the outer end of the wick * * *, said guard having an imperforate top wall and side flame and air openings". Considering the guard as including both cap and supporting flange, appellee's flare has air openings in the guard at the side of the wick,—an important consideration—rather than locating them in the side of the cap.

The non-infringement of claim 11 is based on the claim that appellee has separated the wick-tube-supporting and heat-receiving portions of the flange of the patent. But this overlooks the rule that infringement cannot be avoided by substituting two parts for a single part of a patented structure when the two parts perform the same function as does the single part of the patent. Arthur Colton Co. v. McKesson & Robbins, Inc., 58 Fed. 2, 157, 158; Line Material Co. v. Brady Electric Mfg. Co., 7 Fed. 2, 48, 50.

As to claim 12, it is contended that the word "lateral" applies to the location of the air openings and requires that they be in the cap. The air inlets in the supporting flange of the appellee's flare are located laterally with respect to the wick and wick tube, as are the air inlets of appellant's device.

These arguments, as to non-infringement, fail to give effect to the established rules that infringement exists if the substance of the invention which is defined by the claims, as distinguished from its form, is appropriated, and that

infringement of a combination claim is not avoided by reason of the fact that the appellee is free to use some or all of the separate elements of the combination because they existed in the prior art. Smith *v.* Snow, 294 U. S. 1; Winans *v.* Denmead, 56 U. S. 329; Sanitary Refrigerator Co. *v.* Winters, 280 U. S. 30; Hillard *v.* Fisher Book Typewriter Co., 159 Fed. 439, 442.

On this record we hold that invention has been established and that the appellee's device infringes the claims here sued on.

Decree reversed.

Chase, J., dissenting without opinion.

A true copy.

Wm. Parkin, Clerk.

[Endorsed:] United States Circuit Court of Appeals, Second Circuit. Toledo Pressed Steel Co. v. Montgomery, Ward & Company. (Copy.) Opinion. Manton, Circuit Judge.

APPENDIX B.

IN THE SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1938

No. 166.

THE TOLEDO PRESSED STEEL COMPANY, *Petitioner*,

vs.

STANDARD PARTS, INC., *Respondent*.

No. 167.

THE TOLEDO PRESSED STEEL COMPANY, *Petitioner*,

vs.

HUEBNER SUPPLY COMPANY, *Respondent*.

Affidavit of Carl V. Wisner, Jr.

STATE OF ILLINOIS,

County of Cook, ss:

Carl V. Wisner, Jr., being first duly sworn, deposes and states as follows:

I am counsel for defendant-appellee in the case of The Toledo Pressed Steel Company vs. Montgomery, Ward & Company, which is now pending in the Second Circuit Court of Appeals as Appeal No. 16,071 and involves the validity and infringement of Withrow and Close patent No. 1,732,708, dated October 22, 1929. The appeal in said cause was argued before and submitted to the Second Circuit Court of Appeals on Friday, October 14th, 1938. I have been informed by my New York associate that the Court is likely to deliver its opinion in said cause at the opening of the November session of that Court.

In the event that the decision of the Second Circuit Court of Appeals in said cause sustains the validity and finds infringement of said Withrow and Close patent, it is my intention promptly to petition the Supreme Court of the United States for a writ of certiorari in said cause on behalf of defendant-appellee therein.

CARL V. WISNER, JR.

Sworn to and subscribed before me this 27th day of October, 1938.

ARCHIE L. BERMAN,

[SEAL.] *Notary Public, Cook County, Illinois.*

FILE COPY

FILED
JAN 19 1939
CHARLES ELMORE CROPLEY
CLERK

IN THE

Supreme Court of the United States

October Term, A. D. 1938

No. 603

MONTGOMERY WARD & COMPANY, INC.,
an Illinois corporation,

Petitioner,

vs.

THE TOLEDO PRESSED STEEL COMPANY,
an Ohio corporation,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT.

CARL V. WISNER,
Solicitor for Petitioner.

ANTHONY WILLIAM DELLER,
CARL V. WISNER, JR.,
Of Counsel.

MCCORNICK AND HENDERSON, INC., CHICAGO

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IN THE

Supreme Court of the United States

October Term, A. D. 1938

No. .....

MONTGOMERY WARD & COMPANY, INC., an Illinois corporation,
Petitioner,

vs.

THE TOLEDO PRESSED STEEL COMPANY, an Ohio corporation,
Respondent.

PETITION FOR WRIT OF CERTIORARI

To the United States Circuit Court of Appeals
for the Second Circuit.

TO THE HONORABLE THE CHIEF JUSTICE AND THE ASSOCIATE JUSTICES OF THE UNITED STATES SUPREME COURT:

Montgomery Ward & Company, Inc., an Illinois corporation, complains of the decree and opinion of the United States Circuit Court of Appeals for the Second Circuit, dated November 7, 1938, not reported as yet, entered in a certain cause pending therein, entitled *The Toledo Pressed Steel Company* v. *Montgomery Ward & Company, Inc.*, No. 16,071, reversing the decree of the United States District Court for the Eastern District of New York in favor of petitioner (R. 432), and respectfully petitions for a writ of certiorari to review the same as against The Toledo Pressed Steel Company, an Ohio corporation.

A.

JURISDICTION OF THIS COURT.

This application for a writ of certiorari is made under Subdivision (a), Section 240 of the Judicial Code (28 U. S. C. A., Sec. 347). The suit is for infringement of United States Letters Patent, property of respondent. The decision of the Circuit Court of Appeals is final.

The decision of the United States Circuit Court of Appeals for the Second Circuit holding the patent in suit, Withrow et al. No. 1,732,708, for a burner, valid and infringed, is in conflict with a decision of the United States Circuit Court of Appeals for the Sixth Circuit, *Standard Parts, Inc.* v. *The Toledo Pressed Steel Company*, 93 F (2nd) 336, which held the patent in suit to be invalid.

B.

SUMMARY STATEMENT OF MATTERS INVOLVED.

Prior to the decision in *Standard Parts, Inc.* v. *The Toledo Pressed Steel Company*, 93 F (2nd) 336, respondent filed an action in the United States District Court for the Eastern District of New York for the infringement of Withrow and Close patent No. 1,732,708.

The District Judge filed an opinion finding that the patent was void for want of novelty, that certain claims thereof were aggregative, and, in effect, that the patent covered a new use for a well-known prior art structure (R. 424-430), and a decree dismissing the bill for want of equity was entered (R. 432, 433).

The United States Circuit Court of Appeals for the Second Circuit filed an opinion November 7, 1938, one judge dissenting, in which the decree of the District Court was reversed, the majority of the Court holding that invention

had been established and that petitioner's device infringed the claims in suit, refusing to follow the Sixth Circuit decision.

On or about July 1, 1938, The Toledo Pressed Steel Company, respondent herein, filed a petition for writs of certiorari to review the decision of the United States Circuit Court of Appeals for the Sixth Circuit, Nos. 166, 167, October term, 1938. This petition for certiorari was first denied by this Court October 10, 1938, but was granted November 21, 1938 on respondent's petition for rehearing and a supplement thereto, which set up the conflict of decisions between the Sixth and the Second Circuits.

Respondent's patent covers a flame guard or burner for kerosene torches such as are commonly used as warning signals on the highways. There is a controversy as to the mode of operation of the structure, but its abstract effect is to keep a kerosene flame alight in winds and rain such as are met with on the highways. Claims 2, 5, 11 and 12 are in suit herein. Claims 2 and 5 cover a combination of a conventional torch body with the flame guard or burner described in respondent's patent. Claims 11 and 12 cover the burner alone.

Petitioner contended below that claims 2 and 5 were aggregative, were anticipated by a certain Russian patent to Malcov, No. 1163 of 1868, and that the association of a flame guard or burner with a torch body involved only mechanical skill.

As to claims 11 and 12, petitioner contended below that they were anticipated by a certain structure described in a patent to one Rutz, No. 1,101,146, or, if not anticipated by Rutz, that since defendant was using the Rutz structure, its device could not infringe within rules laid down in many cases. Petitioner further contended that the patent was

void under the patent statute as being for a new use for the structure described in the said Rutz patent.

The United States Circuit Court of Appeals for the Second Circuit, in reversing the District Court, held that the claims were not aggregative, being for a "unitary structure," were not anticipated, and that the device involved more than the exercise of mechanical skill. The Court further held that defendant's use of a prior art structure did not preclude infringement and found that all claims in suit were valid and infringed.

C.

REASONS RELIED ON FOR THE ALLOWANCE OF THE WRIT.

1. This case presents questions of public importance, since it involves a conflict between circuits as to the validity of United States Letters Patent No. 1,732,708, issued October 22, 1929 to respondent on the application of Joseph E. Withrow and Lyman W. Close. Said patent has been held valid and infringed by the United States Circuit Court of Appeals for the Second Circuit in the instant case, and void for want of invention by the United States Circuit Court of Appeals for the Sixth Circuit in *Standard Parts, Inc.* v. *The Toledo Pressed Steel Company*, 93 F (2nd) 336. A petition for writs of certiorari, Nos. 166, 167, October Term, 1938, was granted as to said last-mentioned cases on November 21, 1938.

2. In holding that claims 2 and 5 of the patent in suit are valid as being for a "unitary structure," the Court below has disregarded the doctrine enunciated in *Lincoln Engineering Company* v. *Stewart Warner Corporation*, 82 L. ed. Adv. Sheet 13, p. 695, decided by this Court March 28, 1938.

3. In holding that claims 11 and 12 are not anticipated by the patent to Rutz, No. 1,101,146, but that petitioner's device, which utilizes the Rutz structure, nevertheless infringes said claims, the Court below has disregarded the well-recognized doctrine: "That which does not anticipate cannot infringe," announced by this Court in the following cases: *Peters* v. *Active Manufacturing Company*, 129 U. S. 530, 537; *Grant* v. *Walter*, 148 U. S. 547; *Knapp* v. *Morss*, 150 U. S. 221, 226; *American Fruit Growers Inc.* v. *Brogdex Company*, 283 U. S .1.

4. In holding that a patent is valid in spite of the fact that a prior art device may be "employed without change for the purposes of the patent," the Court below has departed from the rule of numerous decisions of this Court, particularly *Grant* v. *Walter*, 148 U. S. 547, and from its own decisions, *Dwight & Lloyd Sintering Company* v. *Greenawalt*, 27 F (2nd) 823, and *Ingersoll-Rand Company* v. *Worthington etc. Company*, 87 F (2nd) 320.

5. In holding that the claims in suit cover a structure in which the air inlet ports are disposed in a manner entirely contrary to the disclosure of the patent specification, the Court has disregarded principles announced in *Schriber-Schroth Company* v *Cleveland Trust Company*, Nos. 3-5, October Term, 1938, decided November 7, 1938, that: "The patent monopoly does not extend beyond the invention described and explained as the statute requires," and "That it cannot be enlarged by claims in the patent not supported by the specification."

6. The Court erred in making the following findings which are not supported by the evidence and record:

(a) That widely separated unsuccessful attempts had been made to provide some means to prevent the flame from being extinguished;

(*b*) That the patent device reduced oil consumption more than fifty per cent., and that wick consumption was practically eliminated;

(*c*) That the District Court "felt obliged" to follow the Sixth Circuit decision;

(*d*) The Court's findings in reference to the operation of the patented structure and of the Rutz structure (Patent No. 1,101,146) were not supported by the evidence;

and further erred in making such findings without reference to the evidence.

WHEREFORE your petitioner respectfully prays that a writ of certiorari issue to the United States Circuit Court of Appeals for the Second Circuit, commanding said Court to certify and send to this Court, on a day designated, for its review and determination, a full and complete transcript of the record and all proceedings in the United States Circuit Court of Appeals for the Second Circuit had in said cause, to the end that said cause may be reviewed and determined by this Court, as provided by law, and that the judgment of the United States Circuit Court of Appeals for the Second Circuit, reversing the decree of the United States District Court for the Eastern District of New York, may be reversed, and that your petitioner may have such other and further relief in the premises as to this Court will seem meet and just.

CARL V. WIENER,
Solicitor for Petitioner.

ANTHONY WILLIAM DELLER,
CARL V. WIENER, JR.,
Of Counsel.

BRIEF IN SUPPORT OF PETITION FOR CERTIORARI.

I.

OPINION OF THE COURT BELOW.

The opinion of the United States Circuit Court of Appeals for the Second Circuit was rendered November 7, 1938. Rehearing was denied December 5, 1938. The opinion is not yet reported, so far as we are advised.

II.

JURISDICTION OF THIS COURT.

1. The jurisdiction of this Court is based on Judicial Code, Section 240, as amended by Act of February 13, 1925, 28 U. S. C. A. Section 347. The jurisdiction of the District Court arose through a suit brought under the patent statute.

2. The original date of the judgment sought to be revised is November 7, 1938. A petition for rehearing was filed November 19, 1938, within the time provided by the rules of the Circuit Court of Appeals, and a rehearing was denied December 5, 1938.

3. The questions raised in this Court on this record are in substance whether Withrow and Close patent No. 1,732,708, dated October 22, 1929, is valid and infringed. Said patent has been held valid and infringed by the Circuit Court of Appeals for the Second Circuit in the instant case, and void for want of invention by the Circuit Court of Appeals for the Sixth Circuit in *Standard Parts, Inc.* v. *The Toledo Pressed Steel Company*, 93 F. (2nd) 336.

III.

STATEMENT OF THE CASE.

The essential facts of the case are fully stated in the accompanying petition for certiorari and in interests of brevity, are not repeated here.

IV.

SPECIFICATION OF ERRORS.

A detailed specification of errors as claimed by your petitioner is set forth under Section C of the accompanying petition, "Reasons for Granting the Writ," and may be summarized as follows:

1. A conflict exists between the Circuit Courts of Appeal for the Second and the Sixth Circuit, respectively, as to the validity of United States Letters Patent No. 1,732,708, issued October 22, 1929 to respondent on the application of Joseph E. Withrow and Lyman W. Close.

2. In holding claims 2 and 5 of the patent in suit valid as being for a "unitary structure," the Court below departed from the doctrine of *Lincoln Engineering Company* v. *Stewart Warner Corporation*, 82 L. ed. Adv. Sheet 13, p. 695, decided by this Court March 28, 1938.

3. In holding claims 11 and 12 not anticipated by patent to Rutz, No. 1,101,146, but nevertheless infringed by petitioner's device, when said device has been found to use the Rutz structure, the Court below disregarded the well-recognized doctrine: "That which does not anticipate cannot infringe," *Peters* v. *Active Manufacturing Company*, 129 U. S. 530; *Grant* v. *Walter*, 148 U. S. 547; *Knapp* v. *Morss*, 150 U. S. 221; *American Fruit Growers, Inc.* v. *Brogdex Company*, 283 U. S. 1.

4. In holding that a patent is valid in spite of the fact that a prior art device "may be employed without change for the purposes of the patent," the Court below has sanctioned a patent for the use or function of a device and not for a new device, contrary to the patent statute, 35 U. S. C. A., Sec. 31, and to the holdings of this Court in *Great* v. *Walter*, 148 U. S. 547, and contrary to its own holdings in *Dwight & Lloyd Sintering Company* v. *Greenawalt*, 27 F (2nd) 823; *Ingersoll-Rand Company* v. *Worthington etc. Company*, 87 F (2nd) 320.

5. In holding that the claims in suit cover a structure in which the air inlet ports are disposed in a manner entirely contrary to the disclosure of the patent specifications, the Court has disregarded principles announced in *Schriber-Schroth Company* v. *Cleveland Trust Company*, Nos. 3-5, October term, 1938, decided November 7, 1938, that: "The patent monopoly does not extend beyond the invention described and explained as the statute requires" and "That it cannot be enlarged by claims in the patent not supported by the specification."

6. The Court erred in making certain findings of fact, contrary to the evidence, and in making such findings without reference to the evidence.

V.

SUMMARY OF ARGUMENT.

I.

Claims 2 and 5 are aggregative.

Lincoln Engineering Company v. *Stewart Warner Corporation*, 82 L. ed. Adv. Sheet 13, p. 695.

II.

Claims 11 and 12 are anticipated by United States patent to Rutz, No. 1,101,146.

III.

The claims in suit are void since the Rutz structure can be employed without change for the purposes of the patent in suit.

Grant v. *Walter*, 148 U. S. 547;
Dwight & Lloyd Sintering Co. v. *Greenawalt*, [illegible] F (2nd) 823;
Ingersoll-Rand Co. v. *Worthington etc. Co.*, 87 F (2nd) 320.

IV.

If it be the holding of the Court that claims 11 and 12 are not anticipated by patent to Rutz, No. 1,101,146, then petitioner's device cannot infringe, since it uses the Rutz structure.

Peters v. *Active Manufacturing Co.*, 129 U. S. 530;
Grant v. *Walter*, 148 U. S. 547;
Knapp v. *Morss*, 150 U. S. 221;
American Fruit Growers, Inc. v. *Brogdex Co.*, 283 U. S. 1.

V.

The claims, as construed, extend beyond the invention, and are not supported by the specification.

Schriber-Schroth Co. v. *Cleveland Trust Co.*, Nos. 3-5, Oct. Term, 1938, decided November 7, 1938;
Permutit Co. v. *Graver Corp.*, 284 U. S. 57;
Snow v. *Lake Shore M. S. R. Co.*, 121 U. S. 617.

VI.

The Court erred in making certain findings of fact, contrary to the evidence, and in making such findings without reference to the evidence.

ARGUMENT.

I.

Claims 2 and 5 are aggregative.

Claim 2, which is typical of both claims 2 and 5, purports to cover:

(a) a torch body, and

(b) a flame guard, including

(1) a cap with an imperforate top wall,

(2) lateral flame openings adapted to emit a luminescent flame, and

(3) air ports.

The combination of a torch body and a flame guard was not new. It is shown clearly in the Wall patent, No. 228,497 of 1880 (R. 344). The drawings show a torch body A and a flame guard G.

There can be no claim that respondent improved the torch body. In fact, no changes were made in the torch body, because it was the desire of respondent to sell the flame guard as an accessory which earlier purchasers could add to the unprotected torches.

Thus the improvement, if any, was "Of one part of an old combination." In *Lincoln Engineering Co.* v. *Stewart Warner Corp.*, 82 L. ed. Adv. Sheet 13, p. 695, decided March 28, 1938, this Court held, per Mr. Justice Roberts:

> "And the improvement of one part of an old combination gives no right to claim that improvement in combination with other old parts which perform no new function in the combination."

As we have pointed out, there was no change in either combination or function of the torch body, the wick tube

and the wick. Claims 2 and 5 are therefore invalid for the reasons set forth in the *Lincoln Engineering case*. The Circuit Court of Appeals below disregarded these facts and the applicable law.

II.

Claims 11 and 12 are anticipated by United States patent to Rutz, No. 1,101,146.

Claim 11 is typical of these two claims, and covers:

"A burner for a construction torch adapted to emit luminescent flame," including

(a) a wick holder having

(1) a portion in contact with the wick, and

(2) a supporting and heat-receiving flange, and

(b) "means enclosing a space above said flange and surrounding the wick except for provision for lateral exit of flame and restricted entrance of air for combustion."

The Rutz patent covering a flash igniter shows a flame guard for the pilot light on said flash igniter. Considering Rutz in any light, it provides the equivalent of a wick holder in a metal tube carrying a fuel supply. It disclosed what respondent contends is "a supporting and heat-receiving flange." It provides "means enclosing a space above said flange and surrounding" the wick's equivalent "except for provision for lateral exit of flame and restricted entrance of air for combustion." That the Rutz structure must inevitably be an anticipation is disclosed from the demonstrated fact that without structural change it performs every office of the flame guard of the patent in suit, a subject dealt with in the following section.

III.

The claims in suit are void since the Rutz structure can be employed without change for the purposes of the patent in suit.

In both Courts below respondent has made much of the fact that state laboratories have been established for testing safety devices, and that only the patented torch will qualify under the tests which have been promulgated. One of the most difficult states in which to obtain a qualification is Nebraska. This fact was agreed to by respondent's witnesses (R. 53, f. 156).

Petitioner prepared a set of three torches using the Rutz structure as a flame guard, and submitted them for test to the Nebraska Department of Roads and Irrigation, the proper authority. A certificate of qualification was promptly issued (R. 413-423).

This demonstrated beyond question that every function or use of the flame guard disclosed in respondent's patent can be performed by the Rutz flame guard, and that without any structural change.

This brings the patent in suit within the category of those which are void as being for a double or analogous use with prior art structures. The language of *Grant v. Walter*, 148 U. S. 547, 556, is precisely applicable:

> "The most that can be said of this Grant patent is that it is a discovery of a new use for an old device, which does not involve patentability."

The Second Circuit has held to precisely the same effect in *Dwight & Lloyd Sintering Co. v. Greenawalt*, 27 F (2nd) 823, and *Ingersoll-Rand Co. v. Worthington etc. Co.*, 87 F (2nd) 320. In the former of these cases, it was said by Judge Learned Hand at page 828:

> "The use for which (prior art apparatus) was intended is irrelevant if it could be employed without

change for the purposes of the patent in suit; the statute authorizes the patenting of machines, not of their uses."

The Circuit Court of Appeals for the Second Circuit disregarded this point in reaching the decision that the patent was valid and infringed.

IV.

If it be the holding of the Court that claims 11 and 12 are not anticipated by patent to Rutz, No. 1,101,146, then petitioner's device cannot infringe, since it uses the Rutz structure.

The District Court found that the defendant was using the Rutz structure (Finding 7, R. 430). This finding was not disturbed on appeal. It was side-stepped by the argument that the patent was for a "unitary structure," and because:

> "Infringement of a combination claim is not avoided by reason of the fact that appellee is free to use some or all of the separate elements of the combination because they existed in the prior art." (Opinion, p. 9.)

It is to be noted that the combination claims, Nos. 2 and 3, are aggregative, as heretofore pointed out in Section 1 of this argument, and that claims 11 and 12, upon which the Rutz structure clearly reads, are not within the class of combination claims which the Court had in mind. No patent can validly prevent petitioner from combining a torch body and a flame guard, as Wall has done in patent No. 228,497; the combination of a torch body and a flame guard was not new, as this patent clearly discloses. The Rutz flame guard had been disclosed and in public use for twelve or more years when respondent's patentees filed

their application. No valid patent can prevent petitioner from combining the Wall torch body with the Rutz flame guard. To hold otherwise is to disregard the fundamentals.

Since petitioner can validly produce a satisfactory and efficacious device using art of great age in comparison with the structure disclosed in the patent in suit, its device clearly cannot be an infringement, under the well-recognized principle: "That which does not anticipate cannot infringe." Cf. *Peters* v. *Active Manufacturing Co.*, 129 U. S. 530; *Grant* v. *Walter*, 148 U. S. 547; *Knapp* v. *Morss*, 150 U. S. 221; *American Fruit Growers Inc.* v. *Brogdex Co.*, 283 U. S. 1.

The application of this axiom presupposes a finding that the Rutz structure does not anticipate claims 11 and 12. Such a finding can result only from a conclusion that the patentable discoveries of Withrow and Close were the placing of the air inlet ports in the side of the flame guard, the air inlet ports of Rutz being in the horizontally-disposed flange surrounding the conduit for fuel.

Such an infinitesimal change can hardly be dignified as a patentable step.

V.

The claims, as construed, extend beyond the invention, and are not supported by the specification.

In defendant's structure, the air inlet ports are not in the cap, but are in a horizontal flange surrounding the wick tube. Such a structure, is foreign to the drawings and specification of the patent in suit.

The Circuit Court found:

> "No statement in the claims or specifications requires that the cap rest directly on the body of the torch, nor that the air inlet ports be located in the body of the cap."

The specification states (p. 1, ll. 78-82):

"Air inlet openings 10 *being above the lower edge of the cap*, leaves a space within the cap *and above the flange* of the wick holder for comparatively quiescent air." (Italics ours.)

The patented device will not operate as described if the air inlet ports are located anywhere else than in the cap. To hold that the claims cover a different structure extends them "beyond the invention described and explained." *Schriber-Schroth Co.* v. *Cleveland Trust Co.*, Nos. 3-5, Oct. term, 1938, decided November 7, 1938, citing *Permutit Co.* v. *Graver Corp.*, 284 U. S. 57 and *Snow* v. *Lake Shore M. S. R. Co.*, 121 U. S. 617.

VI.

The Court erred in making certain findings of fact, contrary to the evidence, and in making such findings without reference to the evidence.

The points involved are summarily stated in point 6 of Subdivision C of the Petition: "Reasons relied on for the allowance of the writ." Argument here would unduly extend this brief, but it may be noted, for example, that the finding that the patented structure reduced oil consumption more than fifty per cent. is contrary to the findings of a very careful series of laboratory tests (R. 156, f. 467).

It is further to be noted that the Circuit Court made its contrary findings without reference to the evidence, a point as to which this Court has granted certiorari in *Mackay Radio etc. Co.* v. *Radio Corp.*, No. 127, October term, 1938.

CONCLUSIONS.

It is respectfully submitted from the foregoing argument that the Circuit Court of Appeals for the Second Circuit has erred in finding the patent in suit valid and infringed, and that certiorari should be granted to correct this error and reconcile the holding with that of the Circuit Court of Appeals for the Sixth Circuit in the *Standard Parts* case.

All of which is respectfully submitted.

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IN THE

Supreme Court of the United States

October Term, A. D. 1938

No. 603

MONTGOMERY WARD & COMPANY, INC.,
an Illinois corporation,

Petitioner,

vs.

THE TOLEDO PRESSED STEEL COMPANY,
an Ohio corporation,

Respondent.

BRIEF FOR PETITIONER.

CARL V. WISNER,
Solicitor for Petitioner.

ANTHONY WILLIAM DELLER,
CARL V. WISNER, JR.,
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McCORMICK AND HENDERSON, INC., CHICAGO

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No. 603

MONTGOMERY WARD & COMPANY, INC., an Illinois corporation,
Petitioner,

vs.

THE TOLEDO PRESSED STEEL COMPANY, an Ohio corporation,
Respondent.

BRIEF FOR PETITIONER.

I.

OPINION OF THE COURT BELOW.

The opinion of the United States Circuit Court of Appeals for the Second Circuit holding valid and infringed patent to Withrow et al. No. 1,732,708, was rendered November 7, 1938 (R. 447). A petition for rehearing was denied December 5, 1938 (R. 471). The opinion is reported in 99 F (2nd) 806.

II.

JURISDICTION OF THIS COURT.

1. The jurisdiction of this Court is based on Section 240 of the Judicial Code as amended by the Act of February 13, 1926, 28 U. S. C. A. Sec. 347. The jurisdiction of the District Court arose through a suit brought under the patent statute.

2. The original date of the judgment below was November 7, 1938 (R. 447). A petition for rehearing (R. 455-470) was filed November 19, 1938, within the time provided by the rule of the Circuit Court of Appeals, and rehearing was denied December 5, 1938 (R. 471); a petition for a writ of certiorari was filed January 19, 1939 and certiorari was allowed February 6, 1939. There is a conflict in decisions between the Second Circuit in the decision below and the decision of the Circuit Court of Appeals for the Sixth Circuit in *Standard Parts, Inc.* v. *The Toledo Pressed Steel Co.*, 93 F (2nd) 336, which held the patent in suit void for want of invention.

III.

STATEMENT OF THE CASE.

a. The Patent in Suit.

Withrow and Close, No. 1,732,708, the patent in suit, purports to cover a burner. Claims 2, 5, 11 and 12 are sued on.

The device described in the claims and exemplified in respondent's commercial structures, comprises a drawn sheet metal torch body normally sized to contain something more than a quart of kerosene, having an opening at the top for a wick, the wick being usually from five-eighths to three-quarters of an inch in diameter, a wick tube surrounding said wick, and a flame guard positioned on the top base of the torch body having laterally-disposed ports for the exit of flame, and smaller laterally-disposed ports below the flame ports for the inlet of air for combustion. Its principal use is as a highway warning signal.

For a clear understanding of the issues involved, the claims must be divided into two classes; 2 and 5 cover the combination of a burner and a torch body, and 11 and 12 are directed to the burner alone.

Of the first group, claim 2 is typical and specifies:

(*a*) a torch body having an opening for a wick, and

(*b*) a flame guard for said wick, mounted on the outside of said torch body, said guard including

(1) a cap provided with an imperforate top wall

(2) lateral flame openings adapted to emit luminescent flame, and

(3) air ports.

Claim 11, which is typical of the second class, covers:

A burner * * * comprising

(*a*) A wick holder having

(1) a portion in contact with the wick and

(2) a supporting and heat-receiving flange, and

(*b*) means enclosing a space above said flange and surrounding the wick, except for provision for

(1) lateral exit of flame and

(2) restricted entrance of air for combustion.

b. The Conflicting Decisions on the Validity of the Patent.

Respondent first started infringement proceedings in the District Court at Toledo against Standard Parts, Inc., and Huebner Supply Company, distributors of what will be referred to for convenience as the Bolser and Kari-Keen flares, respectively, the references being to the names of the manufacturers. The patent was held valid and infringed in an unreported opinion by the late Judge Hahn, filed in June, 1935. This decision was reversed by the Sixth Circuit in an opinion by Judge Simons, without dissent, reported in 93 F (2nd) 336.

Of the patent, Judge Simons said in his opinion:

"Stripped of variations in nomenclature, and the ingeniously differentiated phrases of counsel in setting

forth the claims, the invention is for a burner with a metal guard to protect the flame from air currents and rain. The art is full of illustration and description of metal guards for burners. * * * There is sufficient suggestion in a burner guard when it is found in one familiar contrivance to point the way to its use in another * * *.

"There is here no substantial evidence of effort general to the industry to solve a problem which long defied it. The proof is limited to experiments of the patentees, and so far as it goes, serves to demonstrate lack of awareness of the teachings of the art rather than the inherent difficulties of the problem itself. They chose the long road to solution, and the patent law does not reward mere persistence, unassociated with original creative effort."

Certiorari was granted on November 21, 1938 to review this decision, in Nos. 166 and 167, October Term, 1938, by reason of the decision in the instant case on November 7, 1938, sustaining the validity of the patent in suit.

A few days before the rendition of the decision in the Sixth Circuit, the bill of complaint was filed against petitioner in the instant case in the United States District Court for the Eastern District of New York. For convenience, the accused device in the instant case will be referred to as the Anthes structure, after Anthes Force Oiler Company, the manufacturer. After a hearing, Judge Moscowitz of that Court filed an opinion, (R. 424-430), finding that the claims in suit were void for want of novelty, that torch bodies and metal guards for the protection of flames were well-known long prior to the filing of the application for the patent in suit; that the claims in suit were aggregative; that the claims in suit involved only me-

chanical skill; that the defendant (petitioner) was using a prior art structure, and that such prior art structure could be used without change for the purposes of the patent in suit.

The Circuit Court of Appeals for the Second Circuit reversed, in an opinion by Judge Manton, Judge Swan concurring, and Judge Chase dissenting without opinion, reported in 99 F (2nd) 806.

In its opinion, the Circuit Court gave the following reasons for differentiating its decision from that of the Sixth Circuit:

> "This record, however, contains evidence absent in the Standard Parts case, showing that the art was in search for this accomplishment: that others worked unsuccessfully to solve the problem. • • • The proof here, not found in the Standard Parts case, showed widely-separate, unsuccessful attempts to provide some means which would prevent the flame from being extinguished. Unsuccessful efforts were made over a long period by men skilled in the art of burners. (R. 449.) • • • Unsuccessful attempts have been made by competitors who had long been in the business of manufacturing and selling open flame torches" (R. 450).

The Court held:

> "The prior art does not disclose or suggest the combination of result here obtained (R. 451). • • • the device here used as a warning signal—the burner—must be considered as an entirety, that is, the oil container, the wick, the wick tube and the top. • • • While torch bodies and flame guards were old, they have never been used together to perform the function or produce the results of the device of the patent in suit. If they were ever combined for any purpose, it

was not to protect the flame at its source so as to provide a small, protected chamber in which some part of the flame would continue to burn regardless of outside weather conditions, with the greater and visible part of the flame burning as a warning signal outside the guard. This combination and use amounted to invention" (R. 453).

c. The Prior Art.

All of the patents relied on by the Circuit Court of Appeals for the Sixth Circuit were in evidence in the instant case, but were not specifically relied on by petitioner. These patents are the following:

Hathaway	No.	147,496	R. 339
Almond	No.	193,796	R. 351
Heston	No.	270,587	R. 347
Blake	No.	453,335	R. 355
Kahn	No.	1,175,527	R. 383

The only patent cited by the Patent Office in prosecution of the patent in suit was Hathaway, No. 147,496, upon which claim 2, as originally drafted, was rejected. (See Record in Nos. 166, 167, p. 99). None of the patents referred to by petitioner were before the Patent Office.

Petitioner below relied upon Russian patent to Malcov, No. 1163 of the year 1868 (R. 325) as an anticipation of claims 2 and 5; on the burner structure of Rutz patent No. 1,101,146 (R. 377) as an anticipation of claims 11 and 12. In addition to the Rutz patent, petitioner relied on widespread public use of the Rutz structure as an anticipation of claims 11 and 12. Wall, No. 228, 497 (R. 343) was referred to as a state-of-the-art patent showing the combination of a torch body and a flame guard as early as 1880.

The Malcov patent is for a chimneyless lamp burner, and shows the combination of a torch body, a wick, and

wick tube, and a metal guard enclosing the end of the wick. The patent drawing shows the structure with flames emanating from the sides of the guard. The top of the guard is perforated with tiny holes. Petitioner's expert, Dr. Matthew Luckiesh[1], Director of Lighting Research for the General Electric Company, however, testified that the Malcov top was "imperforate," in the sense that it offered protection from rain, because the surface tension of the rain drops prevented their going through the tiny holes in the top (R. 80, ff. 238-239; R. 100, f. 299).

The Rutz patent covers a flash igniter for a stove, and the portion of it relied on is the cylindrical hood 8 (Fig. 1 of drawings, R. 378) having air inlet ports 7 horizontally disposed in the bottom flange of the hood and flame openings 8 laterally disposed in the side walls thereof.

A device designed in accordance with the Rutz patent went into commercial use and was widely sold by the Milwaukee Gas Specialty Company of Milwaukee, Wisconsin. The record shows that A. O. Rutz, inventor of the Rutz patent No. 1,101,146, designed the hood 8 to protect the flame of the igniter from precipitated liquids, and lateral currents of air, and that it was tested from time to time to determine its resistance to such elements (R. 393, f. 1177).

Of Rutz, petitioner's expert, Dr. Luckiesh, testified that if the hood 8 were transferred to a torch body, "All the principles of operation remain the same."(R. 127, f. 379, RDQ 339).

As a result of the so-called flare laws, the majority of the states have established administrational qualifications for the use of torches on the highways, and some of the states have designated laboratories for the purpose of

[1]For Dr. Luckiesh's record, see "Who's Who in America," Vol. 20 (1938-1939) p. 1576; he has had 27 years experience during which time he has "done a lot of work on kerosene burners" (R. 122, XQ 333).

testing flares submitted for the approval of state highway commissions.

It is claimed by respondent that no prior art torch will pass the tests which have been promulgated. Petitioner procured three flash igniter guards embodying the hood of the Rutz patent, from the Milwaukee Gas Specialty Company, mounted them suitably on commercial torch bodies, and submitted them to the Nebraska Department of Roads and Irrigation for qualification. They were promptly qualified (R. 413-423). Photographs of the structures submitted are shown on pages 414 and 416 of the record and are reproduced as Figures 1 and 2 on pages 9 and 11 hereof. Respondent's witness on the point agreed that Nebraska was one of the most difficult states in which to obtain a qualification (R. 52, f. 156).

d. History of the Torch Industry.

Open flame torches, comprising a fuel reservoir, wick tube and wick, have been used for numerous purposes, perhaps beyond the memory of man. The first use as warning signals disclosed by the record is that of the Detroit Street Railway, which began using a cast iron, three-wick pot torch about 1913. It ordered its torches as it required them from foundries, accepting the lowest bid for the work. From this, it is a rational inference that at that time there was no organized manufacture of the articles.

So far as the present record discloses, the first person to manufacture a stamped, sheet steel pot torch for general distribution was one McCloskey, of Toledo, Ohio, who engaged in this activity perhaps as early as 1925. To protect his structure from turning over, he weighted the bottom, for which advance in the art he was awarded patent No. 1,610,301. In 1926, respondent was manufacturing the torches for McCloskey, under contract, and in the latter

part of that year, respondent apparently decided to engage in the enterprise on its own behalf, at which time it brought out its first torch, weighted at the bottom and similar to McCloskey's torch. McCloskey brought suit against respondent for infringement, and his patent was held invalid for anticipation by the Circuit Court of Appeals for the Sixth Circuit in *McCloskey* v. *The Toledo Pressed Steel Co.*, 30 F (2nd) 12.

Respondent advertised the virtues of its open flame torch as:

> "The Toledo torch will burn all night, anywhere, at any time, in any kind of weather. It is an all-purpose danger signal" (R. 263)[2].

It is nevertheless said that respondent received many complaints that its torch would be extinguished under severe weather conditions, and patentees, in 1928, commenced a series of experiments to improve the device.

Their first experiments consisted in making the top of the wick tube flush with the top base of the torch body, and projecting the wick tube into the interior of the fuel reservoir, an example of the structure being shown in the circular reproduced on page 289 of the record. The theory of this structure was that the wick would conduct heat inside of the torch body, raising the temperature of the fuel and reducing the tendency to blow out. The device was brought out in July, 1928, and sold during the balance of that year.

Patentee, Withrow, testified that the improvement did not answer all the problems, and further experiments were made, drawings thereof being reproduced on pages 271 to 287 of the record. The experimenters first placed a series of plates around the sides of the wick, then (R. 275) completely housed the flame with a dome-shaped cap having

[2] A reproduction of this circular is shown in Fig. 4 on page 41 hereof.

ports in both the top and sides. Various types of caps were tried, all having imperforate tops and side flame ports, the final result being shown on record page 287. The application for patent was filed December 26, 1928, and the torches were first offered for sale in January of 1929. The structure with the cap was so designed that caps could be sold separately to previous purchasers of respondent's open flame torch, and be readily attached to such torch (R. 25, f. 74).

From 1929 to 1933, torches of the type here involved were used solely as warning signals, about construction work. In the late spring of 1933, the State of Iowa first passed a statute requiring trucks using the highways to carry three torches as warning signals, and requiring the drivers to light and place the torches about the truck whenever the truck stopped on the highways at night. In June of 1933, Anthes Force Oiler Company of Fort Madison, Iowa, whose torch is the accused device in the instant suit, began to manufacture a torch of the type shown on page 253 of the record as licensees of respondent. In July of 1934, because this type of torch with the burner positioned directly on the torch body, was too hot for the operator to handle in practical operation (R. 133, f. 397), the Anthes Company changed to the present style, shown on page 297 of the record, in which the flame guard is elevated on the wick tube and the air inlet ports are positioned in a horizonital flange, below the flame. This obviated the objection (R. 133, f. 398).

Prior to 1933, torches as such were sold only to the contracting industry engaged in street repair and road building, where warning signals were necessary for unprotected excavations. After the passage of the Iowa statute, the devices used on trucks began to be known as "flares." Shortly after Iowa first passed a so-called flare law, a substantial proportion of the other states passed similar laws requiring trucks using the highways to carry flares of the

type here involved, which resulted in a very substantial demand for flares.

A tabulation of respondent's sales of torches or flares from the beginning through the year 1937 follows:

Year	*Units Sold*	*Type Sold*
1926	1,121	Ex. 10
1927	26,630	Ex. 10
1928	39,000 (est.) [a]	Ex. 10, 13
1929	46,624	Ex. 17
1930	53,422	Ex. 17
1931	52,953	Ex. 17
1932	43,197	Ex. 17
1933	76,919	Ex. 17
1934	56,401	Ex. 17, 19
1935	134,831	Ex. 17, 19
1936	186,479	Ex. 17, 19
1937	129,739	Ex. 17, 19

[a] The last 5½ months for sales of Exhibit 13 must be estimated; plaintiff gave only the figure of 19,689 of Exhibit 10 down to July 15, 1928, but there is no reason to suppose there was any loss of sales when Exhibit 13 was brought out.

c. The New Evidence Presented for the First Time in the Instant Case.

As we pointed out in section "b," *supra*, the Court below found evidence in the record of unsuccessful attempts by "competitors who have long been in the business of manufacturing and selling open flame torches" to solve the problem said to have been solved by the patent in suit.

The attempts so characterized consisted of two instances only, one effort during the period from 1922 to 1924 by a Superintendent of Way and Structures of the Detroit Street Railways, who was not a torch manufacturer nor a man skilled in the art of burners. He made only one attempt to solve the problem, and that by placing a flat shield over the top of a pot torch having three wicks. The experiment was abandoned, according to the witness who tes-

tified, because the pins supporting the flat top

> "Would be bent and sometimes broken * * * and we still had trouble with torches being extinguished in a drenching rain or a very high wind, and so we concluded that those happenings were so infrequent that we could just as well get along without the cap, and we discontinued the use." (R. 59, f. 176.)

This concern still uses the open flame torch (R. 61, f. 181).

The other attempt was that of Currie, the Works Manager of the R. E. Dietz Company, a concern which for many years was a large manufacturer of lanterns. In 1928, when the experiments were made, the Dietz Company was not a competitor of respondent, and had never been engaged in manufacturing and selling open flame torches. The Dietz Company found that its lantern business was suffering from the new torch industry (R. 168, f. 502), which, as we pointed out *supra*, apparently originated with one McCloskey, in Toledo in 1925 or 1926.

In 1928, about a year after the Toledo torch first came on the market, Currie, the Works Manager of the Dietz Company, began to experiment with it, to see whether the claims for infallibility, quoted *supra*, were well founded and discovered that it would not stand up in "a very heavy rain. There was nothing to protect it at all." (R. 168, f. 504.) During his experiments, Currie produced three devices, one of them being Exhibit 37, which "would operate with a much lower wick and withstand a very high wind." (R. 171, f. 511.) Currie further testified:

> "I tried it out in the rain and it went out. It occurred to me that I might possibly put a flat shield over the top so that the rain would not get in the center of the wick, that is, that thought must have been in my mind, but I just didn't do it." (R. 175, f. 523.)

Currie claimed to have designed more than the three structures which he produced in Court, but the absence of the others was not accounted for.

No other evidence of widely-separate, unsuccessful attempts than that here referred to was offered. No evidence of "unsuccessful attempts° • • by competitors who have long been in the business of manufacturing and selling open flame torches" (referred to in the opinion of the Court below, [R. 450]) can be found in the record.

f. Performance of the Structures.

The recitals of the specification of the patent in suit state as an object: "A simple and efficient attachment • • • for increasing the efficiency" of such torches (p. 1, ll. 8-10). It is further stated (ll. 93-98):

> "It has been found that with the above described construction and arrangement, the oil consumption is materially decreased. It is also found that the amount of wick used is likewise decreased."

Respondent seeks to substantiate its claims by evidence of some comparative tests conducted by the patentees out-of-doors, conditions being uncontrolled, between one of its early torches and a torch containing the patent flame guard. Samples of the types which respondent tested are shown in the photograph on page 261 of the record. torch B being tested against torch C. The result of these tests was that the patented torch used 2.06 ounces of oil per hour as against 4.95 ounces for the open flame torch.

Of tests of this type, petitioner's expert, Dr. Luckiesh, testified (R: 83, f. 247):

> "The only way you can arrive at a fundamental is control of all variables except one. The only way you can get basic, foundational information on the effect of a cap on efficiency is to test it on and off of a given device. That is the research approach. There is no other way."

He was further of the opinion that a comparison of torch B against torch C was not a fair test of efficiency (R. 95, f. 283).

Petitioner ran a series of tests in the Engineering Laboratories of the University of Iowa under controlled conditions, supervised by Professor Huber O. Croft, head of the Department of Mechanical Engineering in that institution. The results of these tests are as follows:

Air Velocity m.p.h.	*Fuel Consumption in lbs. per hour*	
	With Flame Guard	*Without Flame Guard*
0.0	.037	.094
1.75	.172	.135
4.75	.255	.193
8.5	.340	.239
14.0	.303	.429
25.5	.408	.....

As to wick consumption, Professor Croft testified:

> "It was impossible to detect any consumption in the wick by measurement with a rule. * * * The nearest 1/120 of an inch could be estimated. * * * " (R. 150, f. 450.)

The test for wick consumption covered a six-hour burning period.

As to the proposition that the addition of the flame guard increased the efficiency of the structure, Professor Croft tested devices with and without a flame guard, under still air conditions and velocities of 1.75, 4.5, 8.5, 14 and 25 miles per hour, each test being run for an hour, taking observations of both fuel consumption and illumination. Using the term "efficiency" as it is defined in the lighting art, light output per unit of energy input (R. 75, f. 223), Professor Croft determined that under all circumstances where the open flame torch would burn, it was more efficient than the patented torch, a graphic portrayal of this being shown in Fig. 35 on page 399 of the record, reproduced on page 19 hereof, as Fig. 3. Respondent offered no evidence to substantiate its claims to efficiency.

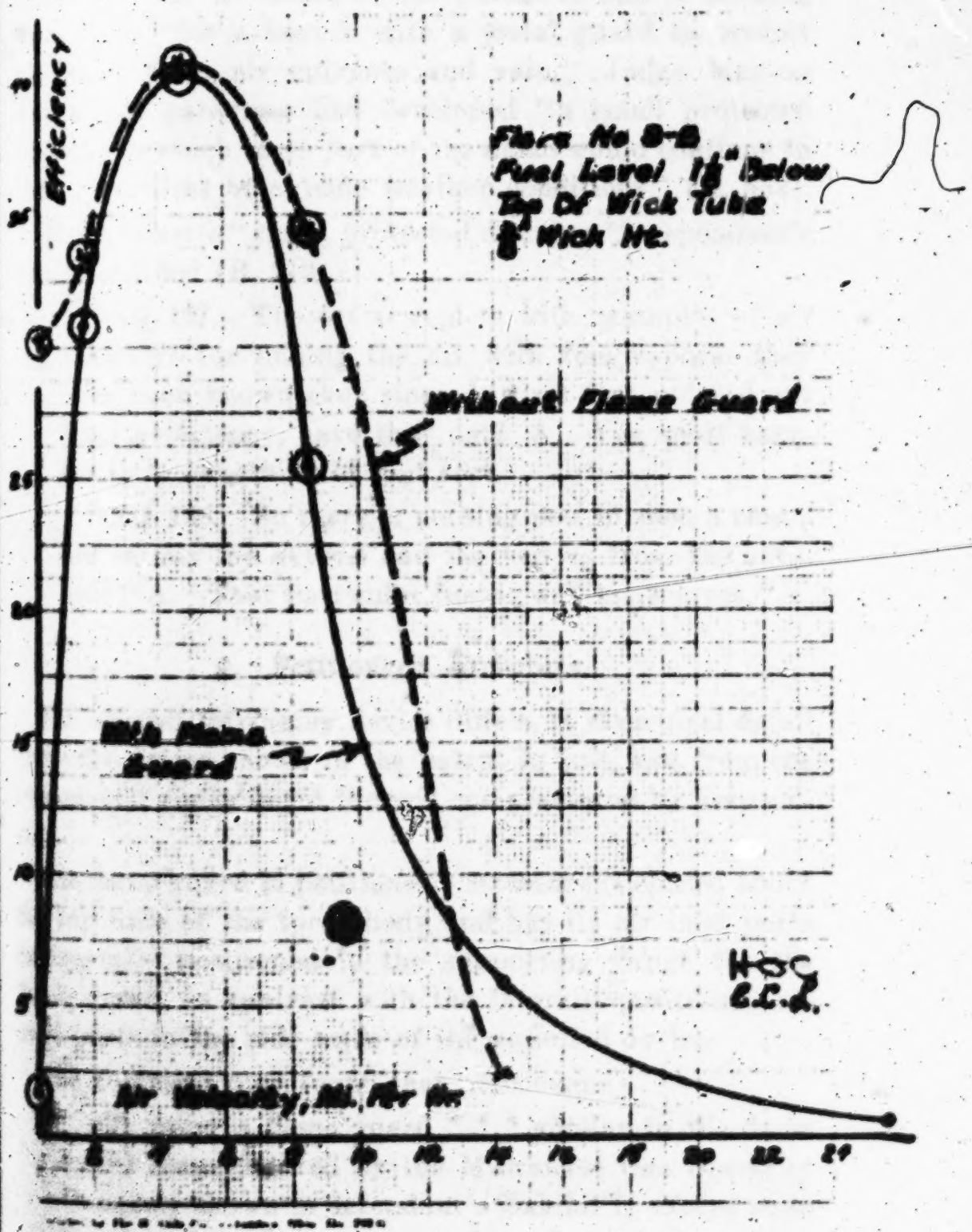

Efficiency
Flame No 8-B
Fuel Level 1⅛" Below
Top Of Wick Tube
⅜" Wick Ht.
Without Flame Guard
With Flame Guard
Air Velocity, Mil. Per Hr.

Fig. 3

Fig. 3.

While Judge Simons, speaking for the Sixth Circuit, found that the invention of the patent in suit is nothing more than "for a burner with a metal guard to protect the flame from air currents and rain," Judge Manton found that patentees had developed "a small protected chamber in which some part of the flame would continue to burn regardless of outside weather conditions" (R. 453).

Of the Court's "small, protected chamber," respondent's expert testified (R. 219):

> "XQ 127. The art is replete with examples of air chambers for mixing the air with fuel vapors: they have been known ever since Argand first pointed out their pertinency, have they not? A. Yes, most burners have something of that sort.
>
> "XQ 128. So there is nothing new in such a chamber to mix the oxygen and the vapors from the kerosene? A. That particular fact is well known, yes."

g. Petitioner's Structure

The alleged infringing device differs in structural detail from the device shown in the patent in suit, and from the commercial embodiment thereof manufactured by respondent.

The flame guard in petitioner's structure is spaced above the top base of the torch body and has its air inlet ports horizontally positioned in the supporting flange for the flame guard, in contrast with the laterally-positioned air inlet ports in the side walls of the patented device.

The District Court found that petitioner:

> "Is using a flame guard * * * similar to the flame guard manufactured by the Milwaukee Gas Specialty Company shown in defendant's Exhibit L, except as to the size of the flame ports, and the Court finds that the

difference in size between the flame ports of (petitioner's) structure and of the Rutz flame guard is immaterial." (R. 430, f. 1288.)

Professor Croft's tests of petitioner's and respondent's devices showed that the two operated differently, the performance curves of petitioner's structure being shown in Fig. 11 (R. 395) and of the respondent's in Fig. 35 (R. 399).

After the Croft tests were completed, respondent made some comparative tests of the two structures under conditions different from those used by Professor Croft. One of the patentees, who made the tests, stated:

"The performance results which I obtained between the Anthes and the Toledo were opposite to each other, but of similar quality, in the opposite direction." (R. 191, f. 572.)

This was corroborated by the other patentee, who stated that the performance of the two torches was "quite the opposite." (R. 183, f. 548.)

Professor Croft testified that in his opinion the reasons for the difference in performance could be accounted for by the differences in construction:

"That is, in the Toledo flare, the wick and flame guard are adjacent to the top of the body of the flare and the air ports are in the sides of the flame guard, while in the Anthes flare the wick and receptacle are elevated above the body of the top of the flare and the air ports are at the bottom of the flame guard receptacle." (R. 155, f. 464.)

One of the elements of the patent structure, pointed out in lines 78 to 89 on page 1 of the specification, is as follows:

"Air inlet openings 10 being above the lower edge of the cap leaves a space within the cap and above the

flange of the wick holder for comparatively quiescent air. This quiescent layer of air in contact with the wick holder and the restriction of the inlet ports to admit to the wick and holder only such air as is needed for combustion aids in maintaining the heat of the wick holder and wick. This militates against extinguishing the flame by high winds."

Of petitioner's device, its expert testified that under any conditions of its operation, the feature of a layer of quiescent air could not exist. (R. 91, f. 271.)

IV.

SPECIFICATION OF ERRORS.

1. The Court below erred in holding that the device of the patent in suit must be considered as an entirety, or that it was "a unitary structure, patented as an entirety."

2. The Court below erred in not finding that claims 2 and 5 of the patent in suit were aggregative, and in not applying thereto the doctrine of *Lincoln Engineering Co. v. Stewart-Warner Corp.*, 303 U. S. 545.

3. The Court below erred in not finding that claims 2 and 5 of the patent in suit were anticipated by Russian patent to Malcov, No. 1163 of the year 1868.

4. The Court below erred in not finding claims 11 and 12 were anticipated by patent to Rutz No. 1,101,146.

5. The Court below erred in finding that the prior art does not suggest the combination of the patent in suit.

6. The Court below erred in finding as a fact:

"That others worked unsuccessfully to solve the problem. • • • Unsuccessful efforts were made over a long period by men skilled in the art of burners. • • •

Unsuccessful attempts had been made by competitors who had long been in the business of manufacturing and selling open flame torches. * * *"

7. The Court below erred in finding as a matter of law that the history of the art demonstrated that the accomplishment of the patent in suit was not easy or apparent, nor merely the work of one skilled in the art.

8. The Court below erred in not finding that nothing more than mechanical skill was involved in the association of a flame guard with a torch body.

9. The Court below erred in finding that the dome shaped cap of the patent in suit was more than a flame guard.

10. The Court below erred in not finding that the claims in suit were void as being for a double or analogous use, for the hood of the Rutz patent No. 1,101,146, or that the claims were invalid because the Rutz hood could be used without change for the purposes of the patent in suit.

11. The Court below erred when, after finding that the hood of the Rutz structure did not anticipate the claims of the patent in suit, in holding that the defendant infringed; since the defendant was found to be using the Rutz structure, the Court should have applied the maxim "That which does not anticipate cannot infringe."

12. The Court below erred in departing from the theory of operation expressed in the patent specification, wherein the patentees had limited themselves to the type of structure in which lateral air inlet ports are positioned in the side walls of the flame guard so that a layer of comparatively quiescent air may be maintained, disclosed in the specification and drawings, to find infringement on the part of the petitioner.

V.

SUMMARY OF ARGUMENT.

I.

Claims 2 and 5 are aggregative.

Lincoln Engineering Co. v. *Stewart-Warner Corp.*, 303 U. S. 545, 549-550;

McGrath Holding Corp. v. *Anzell*, 2nd Circuit 58 F (2nd) 205;

In re Ratican, 1911 C. D. 267, 36 App. D. C. 95;

Westinghouse Electric & Mfg. Co. v. *Wagner etc. Co.*, 225 U. S. 604, 614;

Stromberg Motor Devices Co. v. *Zenith Detroit Corp.*, 2nd Circuit, 73 F (2nd) 62;

Elizabeth v. *American Nicholson Pavement Co.*, 97 U. S. 127;

In re Germantown Trust Co., 57 F (2nd) 365;

Carbice Corp. v. *American Patents Development Corp.*, 283 U. S. 420, 421.

II.

The claims in suit are void for anticipation.

a. **Claims 2 and 5 are anticipated by Malcov Russian patent No. 1163 of the year 1868.**

b. **Claims 11 and 12 are anticipated by Rutz patent No. 1,101,146.**

M. & B. Mfg. Co. v. *Munk*, 2nd Circuit, 77 F (2nd) 261, 262.

III.

Nothing more than mechanical skill was involved in association of a flame guard, similar to the Rutz hood, with a torch body.

Carlton v. *Bokee*, 17 Wall. 463;

N. Y. Scaffolding Co. v. *Chain Belt Co.*, 254 U. S. 32, 36-37;

Thompson Spot Welder Co. v. *Ford Motor Co.*, 265 U. S. 445, 447;

Keyes v. *Grant*, 118 U. S. 25, 36;

Dunbar v. *Meyers*, 94 U. S. 187;

De Forest Radio Corp. v. *General Electric Co.*, 283 U. S. 664;

Paramount-Publix Corp. v. *American Tri Ergon Corp.*, 294 U. S. 464, 474;

Concrete Appliances Co. v. *Gomery*, 269 U. S. 177, 185;

Powers-Kennedy etc. Corp. v. *Concrete Mixing etc, Corp.*, 282 U. S. 175, 186;

Carbice Corp. v. *American Patents Development Corp.*, 283 U. S. 420, 421;

Altoona-Publix Theatres Corp. v. *American Tri Ergon Corp.*, 294 U. S. 477, 486;

Vandenburgh v. *Truscon Steel Co.*, 261 U. S. 6, 13;

Textile Machine Works, Inc. v. *Louis Hirsch Textile Machines, Inc.*, 2nd Circuit, 87 F (2nd) 702, 705, aff'd. 302 U. S. 490.

IV.

The patent in suit is for a double or analogous use of the Rutz hood, and is void under the patent statute, since the Rutz hood can be employed without change for the purposes of the patent in suit.

Aron v. *Manhattan Rwg. Co.*, 132 U. S. 84;
Mast, Foos & Co. v. *Stover Mfg. Co.*, 177 U. S. 485, 493;
Miller v. *Force*, 116 U. S. 22, 28;
Grant v. *Walter*, 148 U. S. 547, 556;
Knapp v. *Morss*, 150 U. S. 221, 227-228;
Dwight & Lloyd Sintering Co. v. *Greenawalt*, 2nd Circuit, 27 F (2nd) 823;
Ingersoll Rand Co. v. *Worthington etc. Co.*, 2nd Circuit, 87 F (2nd) 320;
Potts v. *Creager*, 155 U. S. 597;
Nat'l Cash Register Co. v. *Boston Cash Indicator Co.*, 156 U. S. 502;
Hobbs v. *Beach*, 180 U. S. 383, 392-393;
Rockwood v. *General Fire Extinguisher Co.*, 2nd Circuit, 8 F (2nd) 682, 686.

V.

If it be the holding of the Court that the Rutz hood does not anticipate claims 11 and 12, then petitioner's device does not infringe, since it is using the Rutz hood in its device.

Peters v. *Active Mfg. Co.*, 129 U. S. 530, 537;
Grant v. *Walter*, 148 U. S. 547, 553, 556;
Knapp v. *Morss*, 150 U. S. 221, 226;
American Fruit Growers Inc. v. *Brogdex Co.*, 283 U. S. 1;
Rockwood v. *General Fire Extinguisher Co.*, 2nd Circuit, 8 F (2nd) 682.

VI.

Infringement can be found only through a departure from the theory of the specification and by construing the claims to extend beyond the invention; as construed by the Court below the claims are clearly void.

Schriber-Schroth Co. v. *Cleveland Trust Co.*, Nos. 3-5, Oct. term, 1938, decided Nov. 7, 1938;

Snow v. *Lake Shore & M. S. R. Co.*, 121 U. S. 617, 630;

Mackay Radio etc. Co. v. *Radio Corporation*, No. 127, October term, 1938, decided January 30, 1939;

St. Pierre v. *Redpatch etc. Co.*, 2nd Circuit, 87 F (2nd) 766.

ARGUMENT.

I.

Claims 2 and 5 are aggregative.

The Court below stated as one of its premises:

> "While torch bodies and flame guards were old, they have never been used together to perform the function or produce the results of the device of the patent in suit."

The statement that both types of device are old is abundantly apparent from the record, a perfect example being found in Wall, No. 228,497 (R. 344). Wall's patent was for a chimneyless "mill-lamp" or "torch-lamp," consisting of a torch body A, a wick tube E containing a tubular wick, and a burner G having imperforate sloping sides and a slit in the top through which the flame played. We have not offered Wall as anticipating, since the phraseology of all of the claims in suit suggests an "imperforate dome-shaped cap," and Wall has his flame opening in the top of his cap, and his form is pyramidal rather than dome-shaped. Otherwise, the Wall device is completely comparable to that of the patent in suit. Wall in itself is sufficient to negative the second half of the Court's premise:

> "They have never been used together to perform the function or produce the results of the patent in suit."

Unfortunately for the clarity of the issues, the Court below ignored the Wall patent.

It is further to be noted that when the device of the patent in suit was designed, it was arranged so that the dome-shaped cap or flame guard could be added to the old open flame torch previously manufactured by respondent. No change was made in the torch body, wick tube or wick.

Claim 2 purports to cover the combination of:

(*a*) a torch body and

(*b*) a flame guard, including

(1) a cap with an imperforate top wall,

(2) lateral flame openings adapted to emit luminescent flame, and

(3) air ports.

Claim 5 is sufficiently like claim 2 so that it needs no separate analysis.

Other examples of combination of torch bodies, wick and flame guards shown in the record are Russian patent to von der Weide, No. 1261 of 1869 (R. 335) in which we find a torch body A and a flame guard C, and Russian patent to Malcov, No. 1163 of 1868 (R. 325), in which we find the combination of a torch body, unnumbered, and a flame guard d-d.

These examples clearly demonstrate that the particular combination set forth in claims 2 and 5 was very old in the art. Let us suppose, for the sake of argument, that the type of flame guard disclosed in the patent in suit was novel. Claims 2 and 5 would nevertheless be void under the doctrine of *Lincoln Engineering Co.* v. *Stewart-Warner Corp.*, 303 U. S. 545, in which case Mr. Justice Roberts said, at pages 549-550:

> "As we said of Gullborg in the Rogers case, having hit upon this improvement he did not patent it as such but attempted to claim it in combination with other

old elements which performed no new function in his claimed combination. The patent is therefore void as claiming more than the applicant invented. The mere aggregation of a number of old parts or elements which, in the aggregation, perform or produce no new or different function or operation than that theretofore performed or produced by them, is not patentable invention. *And the improvement of one part of an old combination gives no right to claim that improvement in combination with other old parts which perform no new function in the combination.*" (Italics ours.)

As phrased in claims 2 and 5, the alleged invention clearly sought to cover the improvement of one part of an old combination. Such a claim is clearly void, since the unimproved parts of the alleged combination obviously perform no new function in the combination. The device was so designed, indeed, that the supposedly novel flame guard could be added to prior structures, which remained otherwise unchanged (R. 25, f. 74).

A case in the Court below deciding the same point was *McGrath Holding Corp.* v. *Ansell*, 58 F (2nd) 205, where it was said, per Judge Manton:

"Since this combination was old, the inventor of a new form of one element cannot claim the entire combination, even though he includes his new form of element. * * * The combination of the old elements with the new clamp was new, we think, but this did not amount to invention."

The Court below has sought to differentiate the principles announced in these cases without, however, referring to them, or attempting to distinguish them, upon the theory

that the patent in suit covers a "unitary structure, patented as an entirety." It is stated:

> "But the device here used as a warning signal—the burner—must be considered as an entirety, that is, the oil container, the wick, the wick tube and the top." (R. 452-453.)

Such an argument overlooks the obvious proposition that there can be no functional relationship, as such, between a fuel or other reservoir and the means used to utilize the fuel. This point is clearly brought out in *In re Ratican*, 1911, C. D. 267; 36 App. D. C. 95, a leading and much-cited case, in which the validity of a claim on the combination of:

> "A wheel truck having a water tank thereon and supply and delivery pipes for said tank, and a sector-shaped delivery nozzle * * *,"

was held unpatentable both by the Patent Commissioner and the Court of Appeals for the District of Columbia. It was assumed for the purposes of the decision that the form of nozzle was novel, but there could be no invention in combining it with a water tank. *In re Ratican* was cited with approval by Mr. Justice Roberts in *Lincoln Engineering Co.* v. *Stewart-Warner Corp.*, 303 U. S. 545, 550, footnote 6.

Another leading case cited in footnote 6 of the *Lincoln Engineering Case* referred to is *In re Germantown Trust Co.* (Ct. Customs & Patents Appeals) 57 F (2nd) 365, involving combination claims on improvements in fuel gauges for motor vehicles. Two of the elements involved were con-

ceded to be novel, yet the claims were held to be unpatentable for reasons given in the *Lincoln Engineering Case.*

Similarly, there can be no patentable combination between the carburetor and the gas tank, or between a burner and a reservoir for kerosene. The patentable novelty, if any, must reside in the burner itself, and not in its combination with a source of fuel supply.

As authority to justify the aggregation of the flame guard and the fuel reservoir on the theory that it was "a unitary structure patented as an entirety," three cases involving the question of damages are cited. The facts of these cases cannot possibly be applied to the facts of the instant case.

Reference to a "unitary structure" is old to the patent law where the Court is called upon to apportion profits when a defendant is entitled to manufacture a part of the alleged infringing structure, or where a defendant has added something of his own. Thus the Court said *obiter* in *Westinghouse etc. Co.* v. *Wagner etc. Co.*, 225 U. S. 604, 614, per Mr. Justice Lamar:

> "Where profits are made by the use of an article patented as an entirety, the infringer is liable for all the profits 'unless he can show—and the burden is on him to show—that a portion of them is the result of some other thing used by him.' "

But in that case, the Court did not even hold that the Westinghouse transformer was "patented as an entirety," but remanded it for a new hearing to determine whether an apportionment of profits was necessary or not.

The Second Circuit case referred to, *Stromberg Motor Devices* v. *Zenith Detroit Corp.*, 73 F (2nd) 62, was likewise an accounting case under the Mock patent on a car-

buretor, which was held to be a unitary structure, the plaintiff being entitled to all the profits. This is easily understandable since it seems to have been agreed by the experts on both sides that the patent was "more than a mere aggregation by combining two old devices." One judge, however, dissented on the ground that even the carburetor was not unitary and that profits should be apportioned. This case might be informative if the Mock patent had covered the gas tank as well as the carburetor, but on the facts, it does not help.

Elizabeth v. *American Nicholson Pavement Co.*, 97 U. S. 127, the third authority referred to by the Court below, is somewhat different, involving the question of the validity of a combination patent for street paving, and questions of profits. The patent covered a pavement comprising a foundation, parallel-sided wood blocks, strips between the blocks to space them and a filling of gravel and tar. None of the alleged anticipations combined all the elements, much less an arrangement of the elements according to the patent. On the question of profits, the Court characterized the patented pavement as: "A new thing, like a new chemical compound."

This is hardly the category in which respondent's pot torch and flame guard can be placed. Not only are the elements old, but the combination of a torch body and flame guard is old, and only in the precise type of flame guard, with the air ports in the side walls of the guard, can we find a dubious newness, if it can be found anywhere.

It is thus apparent that the Court below has forcibly lifted a principle from the law of accounting, where its function is to determine the burden of proof, and injected it into the law of aggregations where it has no proper place, burden of proof not being a consideration. The creation of

new rules of law through analogy is sometimes necessary, but analogies can be forced only so far before the breaking point is reached, as it is here when one considers that under the rule of *Westinghouse etc. Co.* v. *Wagner etc. Co.*, 225 U. S. 604, 614, quoted, even though an article be "patented as an entirety," the infringer has the privilege of showing that some portion of the profits derived from the sale are attributable to his additions to the device.

The most recent case presenting what might be classified as a unitary structure as respondent sees it, is *Carbice Corp.* v. *American Patents Development Corp.*, 283 U. S. 420, 421, in which a refrigerating container was considered. Of it, the Court said, per Mr. Justice Brandeis, at page 421:

> "The alleged invention is for the locational arrangement of materials within a container. Whether a locational arrangement within a structure can ever be patented as a manufacture need not be determined. * * * For the combination in suit lacks patentable invention and novelty. Each of the elements—refrigerant, material to be refrigerated, and container—perform its function in a known way."

All of these considerations apply completely to the instant case, as will be pointed out more specifically under Sections III and IV *infra*.

II.

The claims in suit are void for anticipation.

a. Claims 2 and 5 are anticipated by Malcov Russian patent No. 1163 of the year 1868.

All of the elements specified in claims 2 and 5 are found in the early Russian patent to Malcov, No. 1163 of the year 1868 (R. 325).

Claim 2 covers the combination of:

"In a device of the class described" (Malcov is of that class)

"(*a*) a torch body" (Malcov has a torch body) "having an opening for a wick" (Malcov has an opening for a wick) "and

(*b*) a flame guard for said wick mounted on the outside of said torch body" (Malcov has a flame guard mounted on the wick tube, but respondent's contention is that such a mounting is within the scope of this claim) "said guard including

(1) a cap provided with an imperforate top wall, and

(2) lateral flame openings adapted to emit a luminescent flame" (Malcov has such flame openings and shows them emitting luminescent flame) "and

(3) air ports."

Respondent attempts to differentiate Malcov because he has no air ports and because he provided minute perforations in his top.

The minute perforations may possibly have been inserted as orifices through which gas, which burns outside as flame, might be emitted. The evidence shows, however, that Malcov's top is imperforate in the sense that rain does not penetrate to the interior, by reason of the surface tension of the rain drops (R. 80, f. 238-239; R. 100, f. 299).

The other point of differentiation is that Malcov has only one opening for the inlet of air and the emission of flame. In this aspect, Malcov, to all practical purposes, is no wise different from the structure of the patent in suit. Dr.

Luckiesh pointed out, in reference to the operation of the structure of the patent in suit, that the air ports did not supply sufficient air at zero wind, which was the reason for the extremely low candle power provided by the device under such a condition. At any winds above zero velocity, the air ports were not needed, because the flame ports became air ports automatically (R. 88, f. 262). Respondent's expert agreed that in any appreciable wind, more air would be coming in through the flame openings than through the air openings (R. 219, f. 657, XQ 132).

Respondent's principal criticism of Malcov, however, has been directed to the deficiences of his patent draftsman, and not to the inapplicability or inoperability of his device. Contrary to the supposition of the Court below, Dr. Luckiesh had no difficulty in understanding the operation of Malcov (R. 103, XQ 210, ff. 308-309). It presents all of the elements of an anticipation, in that it has all the items described in the claims which it is alleged to anticipate, and can operate satisfactorily for the purposes of the patent in suit (R. 81-82, ff. 243-244). Malcov was not considered in the Patent Office prosecution (see Record in Nos. 166, 167, page 99).

b. Claims 11 and 12 are anticipated by Rutz patent No. 1,101,146.

Claim 11 covers: "A burner for a construction torch adapted to emit luminescent flame, * * *."

All of the language after the word "burner" is functional, and is directed to the purposes to which the burner is to be put. It can furnish no basis for giving the claim a validity to which otherwise it would not be entitled.

Disregarding this functional language, claim 11 covers:

(a) a wick holder having

(1) a portion in contact with the wick and

(2) a supporting and heat-receiving flange, and

(*b*) means enclosing a space above said flange and surrounding the wick except for provision for lateral exit of flame and restricted entrance of air for combustion.

While the Rutz hood 8, shown in Patent No. 1,101,146, is not a "burner for a construction torch," it is nevertheless a flame guard adapted to emit luminescent flame, since, as we shall point out at greater length, *infra*, it may be used without any change whatsoever to achieve the results sought to be attained in the patent in suit.

The Rutz hood 8 is a burner; it has a flange which respondent characterizes as a "supporting and heat-receiving flange," when used by petitioner in its structure; it has a "means enclosing a space above said flange and surrounding the wick except for provision for lateral exit of flame," 8' in the patent drawings (R. 378); and it has "restricted entrance of air for combustion," 7 in the patent drawings.

Claim 12 covers substantially the same elements as claim 11 and is similarly anticipated by the Rutz hood.

All of the requirements for an anticipation are present when the anticipating device may be used without change for the purposes of the patent. "It is enough to anticipate if the earlier device is susceptible of the new use, as it stands and without change." *M. & B. Mfg. Co.*, v. *Munk*, 2nd Circuit, 77 F (2nd) 261, at page 262, per Judge L. Hand.

The Rutz hood 8 was likewise not considered in the Patent Office prosecution (see record in Nos. 166, 167, page 99).

III.

Nothing more than mechanical skill was involved in association of a flame guard, similar to the Ruts hood, with a torch body.

While it would seem clear from the foregoing that the patent in suit can have no validity in view of the prior art, it has nevertheless been argued at length by respondent that the addition of a burner cap or a flame guard, having air inlet ports and flame outlet ports, to a torch body for use as a warning signal upon the highways, was a brilliant flash of genius upon the part of the patentees, entitling them to a status of generic inventors fortified with claims broad in scope.

Patentees claim to have been popularizers of such a device, and pioneers in developing highway warning signals. They say their device is the only one which will successfully satify the rigid requirements set up by state testing laboratories.

If there were a torch industry, respondent came into it very late. Patentees were introduced to the industry by McCloskey, the first popularizer of sheet metal open flame torches, and for some time respondent produced such torches for McCloskey as a contract fabricator. Patentees found their principal's business good and decided to engage in it upon their own behalf. What skill in the art they had was acquired as they went along.

Sometime in 1928, it became apparent to them that means would have to be provided to prevent the flame from being extinguished by wind or rain. This consciousness existed while their advertising literature continued to extol the efficacy of the open flame torch, which it was represented to prospective purchasers would "burn all night, anywhere, at any time, in any kind of weather," (R. 263). (See also

Fig. 4, p. 41 hereof). Whatever be the truth of the matter, the continued reiteration of such a claim in the face of the known deficiencies of the device necessarily shakes one's confidence in patentees' good faith. When a manufacturer is once impaled upon the spike of a consciously false claim, it is but a rational inference that claims of the functional superiority of a succeeding device may be equally untrue. The point is important, in view of the present extravagant claims made by the patentees in the specification and on the witness stand.

Patentees first attempted to pre-heat the oil by extending the wick tube into the container, the desirability of which was pointed out to them if nowhere else, in the case of *Carlton* v. *Bokee*, 17 Wall. 463, where it was stated:

> "In (the old lamps) the flame was set close to the lamp, and the wick tube holding the wick was projected downward into the oil, so that the heat of the flame might be communicated thereto in order to render it more fluid and susceptible to the capillary attraction of the wick,"

which was common knowledge when that case was decided in 1872. Patentees' first effort utilized these features, and they have been continued into the patented structure as a basis for invention. It was found not to be enough, whereupon patentees placed a set of baffle plates around the wick (R. 271-273). Salsbury produced a structure superior to those in 1895 (R. 329). Since these left the top open so that rain could snuff the flame, it became apparent that some sort of horizontal top covering was necessary. The first structure of this type is shown on page 277 of the record, and the second, shown on page 279, differs but little from the structure ultimately adopted.

The unfortunate aspect of these experiments lies in the unnecessary motions in which the patentees indulged before

THE

TOLEDO TORCH

The only real protection for open construction work at night.

The minimum protection required by law (red lanterns) is not sufficient to keep you out of personal injury suits. But—

YOU ARE SAFE
with
THE TOLEDO TORCH

Note the sturdy, substantial construction. Rigid pressed steel with a cast iron weight welded into the bottom—it is always self-righting. No matter how it is kicked or tumbled about, like a cat it always lands right side up.



Nothing to break; so distinctive it will never be stolen. The use of

THE TOLEDO TORCH

eliminates a big and constant item of expense.

Simple to operate, no globes to clean. Just fill with kerosene and light. Put TOLEDO TORCHES around the open work or in the holes you leave. No barricades are needed.

No one can mistake the warning of this signal. Its ruddy flame is seen from a greater distance, it instantly attracts attention. The TOLEDO TORCH gives enough light to see all the danger.

Seven inches in diameter, holds seven-tenths of a gallon of kerosene. The TOLEDO TORCH will burn all night anywhere, at any time, in any kind of weather. It is an all-purpose danger signal.

Used by state and county highway departments, cities, public utilities, road builders and progressive contractors — everywhere. To them The Toledo Torch has proven the economical solution of a troublesome and expensive problem.

FIG. 4.

they produced a product which satisfied them. A reference to the Patent Office file on "chimneyless hydrocarbon burners," in which category the structure in suit is placed, would have revealed Wall, No. 228,497, a device undoubtedly superior to most of the structures shown on pages 271-287 of the record. But, as Judge Simons comments, "They chose the long road to solution."

Granting the truth of patentees' evidence that numerous different structures were attempted, very promptly upon their becoming aware of the fact that simple partial enclosure of the sides of the flame would not prevent rain from putting it out, they concluded that some sort of top was necessary. Their experience was completely paralleled by the Detroit Street Railways experimenter six years before.

As the Court suggested in *New York Scaffolding Co.* v. *Chain Belt Co.*, 254 U. S. 32, at pages 36-37 it is certain that the struggle through which these patentees went could not have caused them sleepless nights or laborious days. Patentees, like the inventor in the *New York Scaffolding Case*, were not experienced in the art in which they were attempting to make advances, forcibly demonstrated by the crude nature of their original experimental structures, and the comments of the Court in that case seem apt:

> "* * * But one is forced to think that where a change is readily made in a composite instrumentality, the change is not the prompting or the product of invention."

But, it is said that others likewise struggled to attain the achievement of the patent in suit. The Court below has commented in its opinion:

> "Others worked unsuccessfully to solve the problem. The proof here * * * showed widely-separate, unsuc-

cessful attempts. * * * Unsuccessful efforts were made over a long period by men skilled in the art of burners. * * * Unsuccessful attempts were made by competitors who had long been in the business of manufacturing and selling open flame torches."

We do not concede that if such were the case, it would necessarily negative the conclusion that only mechanical skill was here involved. But we submit on the record in the instant case that the inferences drawn by the Court below are entirely unsupported by any facts in the record.

In the Statement of the case, point "d," we have analyzed the evidence offered by respondent in support of its position, and it need not be repeated here, except in summary form.

Prior to or contemporaneously with the patentees, two persons attempted to design a torch which would not be snuffed in wind or rain.

The first, in point of time, was an employee of the Detroit Street Railways. Taking the three-wick, cast iron torch which that company had been using since 1913, sometime in 1922 he placed a flat shield, supported by a pin, over the three wicks. The experiment continued for about two years. It was abandoned, and no other attempts appear to have been made by the experimenter. This is not an instance of an effort by one skilled in the art, or of a manufacturer or competitor of respondent. If significant of anything, it indicates that the first concept which came to this unskilled investigator was that of putting a flat umbrella over the top of the flame.

The second attempt came after respondent's unprotected torch was on the market, in 1928, from a manufacturer which found it was losing some of its lantern business to the open flame torches. During a period of two years three

devices were produced, which were offered in evidence in Court, although others are said to have been tested. One of these devices would withstand a very high wind (R. 171, f. 511); in the rain it went out. The experimenter testified:

> "It occurred to me that I might possibly put a flat shield over the top so that the rain would not get in the center of the wick, that is, that thought must have been in my mind, but I just didn't do it." (R. 175, f. 523.)

Can this individual be said to be a person skilled in the art? He claimed to be indulging in a continuous and extensive research (R. 169, f. 505), but he did not do that "which must have been in his mind" and which, had it been done, would have led him simultaneously along the trail of the patentees, first to a device somewhat like that shown on page 277 of the record, and subsequently, in all probability, to a device closely akin to that of the patent in suit. It is also highly significant that this experimenter was a licensee of respondent, required under terms of its license to support respondent in litigation (R. 173, f. 517).

It is respectfully submitted that to designate these two isolated efforts of inexperienced experimenters as

> "Unsuccessful attempts * * * by competitors who had been long in the business of manufacturing and selling open flame torches," (R. 450)

is unsound to the brink of absurdity.

A majority of the patent cases decided during the past two decades turn on the question of whether anything more than the skill of the mechanic was involved in devising the structure upon which a patent was issued. This is a question of fact (*Thompson Spot Welder Co.* v. *Ford Motor Co.*, 265 U. S. 445, 447; *Keyes* v. *Grant*, 118 U. S. 25, 36)

and upon this subject the opinions of the experts may be considered (*Dunbar* v. *Meyers*, 94 U. S. 187).

It is the theory of the patent law that whether inventors knew of prior art structures or not, they are presumed to have designed their devices in view of all of the prior art. The question here involved is whether, in view of Russian patent to Malcov, No. 1163 of 1868, Wall's "mill-lamp" or "torch-lamp" of 1880, and the Rutz hood of 1914, any invention can be said to reside in the addition of a flame guard akin to that hood to the body of the McCloskey torch of 1925. This question was gone into in detail in cross examination of the petitioner's expert, Dr. Luckiesh, on the trial, and the following interrogation was given and answered:

> "RXQ 350. It is your opinion that a man skilled in the art, who was seeking to produce a warning flare in a kerosene burner that would withstand gale velocities as high as forty miles an hour, if he knew of this gas burner of Rutz, that that would at once occur to him as being adaptable and usable for the purpose of producing that flare which would withstand gale velocities. Do you mean to testify to that?
>
> "A. If he were consciously searching for something of the sort that you describe * * * and he knew of Rutz * * * that would occur to him automatically." (R. 129, ff. 386-387.)

This was the only direct evidence in the record on the point and no attempt was made by respondents to refute it.

If we assume that patentees were "consciously searching" for an efficacious flame guard, even though they did not know of the Rutz hood, so far as the record goes, they nevertheless produced the device of the patent in suit—very similar to Rutz—very promptly.

At about the same time, Currie of the Dietz Company was half-heartedly experimenting in an attempt to get something better than the open flame Toledo torch. He cannot be said to have been "consciously searching" for an efficacious device, because, on his own testimony, he did not do that which his experience told him he should have done, and that which, had he done it, would have solved the problem.

Another observation which may be pertinent is that the device of the patent in suit did not come as an answer to a long-felt want. No substantial market developed until three and one-half years or more after the patent issued, when the State of Iowa, leading the procession, required all trucks using its highways to carry three flares, and petitioner's heavy sales of more than 100,000 torches annually did not come until two years later, in 1935. The record further shows that the necessity of a protected torch has not yet penetrated to a very substantial user, the Detroit Street Railways, which still seems satisfied with its cast iron torch and three unprotected wicks.

A lame attempt to explain the hesitancy of the Detroit Street Railways to adopt the improved torch was made in the record, when respondent's witness on the point testified:

> "(The protected torches) have never been used • • • because we have a torch designed to take care of our peculiar circumstances. The torch has got to be low enough to set down in the depth of the brick pavement." (R. 61, f. 181.)

Respondent makes such a torch (See record in Nos. 166, 167, page 181, Exhibit 11 A, "Model F" torch).

Under the reasoning of *De Forest Radio Corp.* v. *General Electric Co.*, 283 U. S. 664, and *Paramount-Publix Corp.* v. *American Tri-Ergon Corp.*, 294 U. S. 464, 474, this

was not the filling of a long-felt want. When the alleged inventing was done, there was no public demand. That came long after the alleged inventive act. The device of the patent in suit, then, would seem to be nothing more than a natural development in the art.

In determining whether or not mechanical skill was involved in the production of the patented device, the Court should further consider that the assemblage of the patent in suit involved elements all admittedly old, whether from kindred arts or not. This was conceded by the Court below. The applicable principles are shown in *Thompson Spot Welder* v. *Ford Motor Co.*, 265 U. S. 445, 451; *Concrete Appliances Co.* v. *Gomery*, 269 U. S. 177, 185; *Powers-Kennedy etc. Corp.* v. *Concrete Mixing etc. Co.*, 282 U. S. 175, 186; *Carbice Corp.* v. *American Patent Developments Corp.*, 283 U. S. 420, 421; *Altoona Publix Theatres Corp.* v. *American Tri-Ergon Corp.*, 294 U. S. 477, 486, in all of which decisions devices involving an assemblage of known elements having known functions were considered and found to have required nothing more than mechanical skill.

That all of the concepts involved and all of the means employed in the patented structure were old is abundantly borne out by the record. Disregarding the operation of the fuel reservoir, wick tube and wick, which patentees were trying to improve, the supposed new concepts as outlined in the patent specification, with the record facts applicable thereto, may be classified as follows:

a. *Heat reflection.* The specification states: "Heating of the wick is facilitated by reflection of heat from the dome-shaped cap" (ll. 72-74).

This premise is fallacious. Dr. Luckiesh testified that after the device had been in operation a few minutes, the

dome-shaped cap would be sooted up and could not possibly reflect any appreciable amount of heat. Soot, or carbon black, is used for many scientific purposes because it reflects no appreciable amount of radiant energy (R. 77, QQ. 53, 56).

b. *Conduction.* From the specification we learn: "Heating of the wick is facilitated by conduction to wick-holding collars 12 and 6 from their supporting flanges" (ll. 75-76).

This feature was described in Dr. Luckiesh's book on Artificial Light, published in 1920, page 60 (R. 81), and is true "of every kerosene device that has a holder around it" (R. 80, Q. 71). See also *Carlton* v. *Bokee*, 17 Wall. 463, quoted above, and the decription in the Malcov specification (R. 327-328, ff. 981-982).

c. *Quiescent air.* The specification states:

"Air inlet openings 10 being above the lower edge of the cap leaves a space within the cap and above the flange for comparatively quiescent air." (ll. 78-83).

Of this feature, petitioner's expert testified:

"It may be reasonably quiescent in the state of zero wind velocity, but it is inconceivable that you could describe that as a layer of quiescent air when there is any wind velocity above practically zero" (R. 78, Q. 59).

d. *Restriction of inlet ports.* The specification states:

"The quiescent layer of air in contact with the wick holder and restriction of inlet ports to admit to the wick and holder only such air as is needed for combustion * * * " (ll. 83-86).

Dr. Luckiesh testified: "In a wind, they would cease to function as air ports" (R. 88, Q. 103). Respondent's expert agreed in principle (R. 219, XQ. 132).

e. *Admission of air.* Of this, the specification says: "Sufficient cool outer air is supplied to the end portion of the wick through the ports 10 for securing a satisfactory flame * * *" (ll. 89-91).

Petitioner's expert testified:

> "We found by test that (the air ports) did not supply enough air apparently at zero wind. That was responsible for the extremely low candle power. If they did not function at zero wind they are not needed for winds above it because the flame ports become air ports automatically" (R. 88, Q. 103).

Respondent's expert agreed in principle (R. 219, XQQ 130-133).

At zero wind, the patented device with the wick extension of one-eighth of an inch, recommended by respondent, over an hour period, under controlled conditions, produced an average of 0.047 foot candles (R. 408, Item 32), or less than one-tenth of the candles produced by a lighted match (R. 87, f. 260). Patentee Withrow admitted that the device did not work so well in calm weather (R. 35, f. 103).

f. *Decrease in oil consumption.* The specification states: "It has been found that with the above-described construction and arrangement, the oil consumption is materially decreased" (ll. 93-96).

The tests showed that at zero wind velocity a very low oil consumption was achieved (0.037 pounds per hour), but at a savage sacrifice of illumination. At average wind velocities, up to ten miles per hour, the flare with the flame guard consumes more fuel than the flare without (see

graph, R. 401). The observations of the testing engineers from an hour's test under each condition, in pounds of kerosene consumed per hour, were:

Wind Velocity m. p. h.	*Without Flame Guard*	*With Flame Guard*
1.75	0.135	0.172
4.50	0.193	0.255
8.50	0.239	0.340
14.00	0.429	0.303
Average	0.249	0.2675

This is the converse of the "material reduction" mentioned in the patent specification, or the fifty per cent. saving which the Court below erroneously assumed was the fact in reaching its decision.

Respondent sought to substantiate its claims by comparative tests between devices which were not comparable, and the unprotected flare it used, Exhibit 10, was not as satisfactory a torch as Exhibit 17, which immediately preceded the patented torch (R. 20, f. 60). In respondent's tests, it extended the wick of the unprotected torch an inch and a half, unnecessary according to petitioner's tests, which showed the most efficient height to be one-half inch (see graph, R. 397). This is corroborated by the Detroit Street Railways' practice, which has used the half-inch extension since 1913 (R. 58, f. 173) As the trial court pointed out: "It is common sense to realize that the longer the wicks are, the more oil will be consumed" (R. 48, f. 143).

g. *Protection from wind and rain.* The specification states: "Another outstanding advantage resides in reducing the liability of extinguishing the flame by high winds or rain" (ll. 98-100).

In the opinion of Judge Simons, this was all patentees produced. The concept that a hood with imperforate top, side flame openings and air ports would protect a flame from wind and rain was not original with patentees. Rutz understood it thoroughly and designed his hood 8 with this in mind, as early as 1914 (R. 393, f. 1177).

Thus nothing is left to patentees save the dubious honor of being the popularizers of the Rutz hood 8 as the flame guard for a highway warning signal. The fact that patentees were the first introducers or popularizers is not in itself significant, *Vandenburgh* v. *Truscon Steel Co.*, 261 U. S. 6, 15; *Textile Machine Works, Inc.* v. *Louis Hirsch Textile Machines*, 2nd Circuit, 87 F (2nd) 702, 705, affirmed 302 U. S. 490.

In the *Vandenburgh Case*, it was said, per Mr. Chief Justice Taft, at page 15:

> "But it is insisted that Vandenburgh was the first to introduce into the field of concrete reinforcing the kerf and integral spur to clamp the spiral rod; * * * It may be true that, in the field of reinforcing concrete, the kerf and spur had not been used before as Vandenburgh used it, but the kerf and spur were old in the art of kindred fields. They were old in metal-working art * * *."

In the *Textile Machines Works Case*, affirmed by this Court in 302 U. S. 490, it was said, per Judge L. Hand, at page 705:

> "It may be that the introducer, the popularizer, of a new and valuable variant, should gather the profits; perhaps any new use should be enough. But the law is not so; * * *."

As a summation, all of the concepts and elements comprising the patented device were old and well-known when patentees entered the art. They should have come readily to the hands of any artisan who was "consciously searching" for a solution to the problem. Even with their tedious methods of "cut and try," as counsel has characterized their efforts, patentees very readily achieved the desired result.

IV.

The patent in suit is for a double or analogous use of the Rutz hood, and is void under the patent statute, since the Rutz hood can be employed without change for the purposes of the patent in suit.

The trial Court found that the Rutz hood 8 "may be employed without change for the purposes of the patent in suit" (R. 430, f. 1289).

Such being the evidence in the case, claims seeking to monopolize a new use for that structure are void.

This Court has followed this principle numerous times, the most applicable citations being *Aron* v. *Manhattan Railway Co.*, 132 U. S. 84; *Mast, Foos & Co.* v. *Stover Mfg. Co.*, 177 U. S. 485, 493; *Grant* v. *Walter*, 148 U. S. 547, 556; *Miller* v. *Force*, 116 U. S. 22, 28; *Knapp* v. *Morss*, 150 U. S. 221, 227-228. This principle has been applied recently in the Second Circuit in *Dwight & Lloyd Sintering Co.* v. *Greenawalt*, 27 F (2nd) 823; *Ingersoll Rand Co.* v. *Worthington etc. Co.*, 87 F (2nd) 320.

The instant case presents the strongest factual basis within the principles of the above cases that has yet been submitted to this Court. It has been demonstrated conclusively that the Rutz hood 8 can be used without change for the purposes of the patent in suit. In the Statement

of the case, we have alluded to the qualification of a set of flares, using the Rutz hood as a flame guard, in the State of Nebraska. One of respondent's witnesses testified that this was one of the most difficult states in which to obtain a qualification (R. 52, f. 156). Photographs of the devices which qualified are shown on pages 414, 416 of the record, and as Figures 1 and 2 on pages 59 and 11 of this brief.

In *Aron* v. *Manhattan Railway Co.*, 132 U. S. 84, where railway car gates were in question, Mr. Justice Matthews pointed out the rarity of cases in which a prior art device can be used *without any actual change*, saying:

> "It rarely happens that old instrumentalities are so perfectly adapted for a use for which they were not originally intended as not to require any alteration or modification. If these changes involve only the exercise of ordinary mechanical skill, they do not sanction a patent; and, in most of the adjudged cases where it has been held that the application of an old device to a new use was not patentable there were changes of form, proportion or organization of this character which were necessary to accomodate them to the new occasion."

The record presents, however, one of those rare instances in which no changes whatsoever in "form, proportion or organization," are necessary.

The fact that the prior art device had never been used in the same environment as that disclosed in the patent was considered in *Mast, Foos & Co.* v. *Stover Mfg. Co.*, 177 U. S. 485, 493, which involved a patent on an internal toothed gear for windmills. It was said, per Mr. Justice Brown:

> "Martin, therefore, discovered no new function; and he created no new situation, except in the limited sense

that he first applied an internal gearing to the old Mast-Foos mill, which was practically identical with the Martin patent, except in the use of an internal gearing. He invented no new device; he used it for no new purpose; he applied it to no new machine. All he did was to apply it to a new purpose in a machine where it had not before been used *for that purpose.*"

In the instant case, the respondent's torch body "is practically identical with the (McCloskey patent R. 388) except in the use of (a flame guard)."

That utility alone is insufficient was the holding in *Grant v. Walter*, 148 U. S. 547, a case involving the validity of a patent on a silk winding reel. In discussing this point, the Court said, per Mr. Justice Jackson, at page 556:

"The most that can be said of this Grant patent is that it is a discovery of a new use for an old device which does not involve patentability. * * * The advantages claimed for it, and which no doubt it possesses to a considerable degree, cannot be held to change this result, it being well settled that utility cannot control the language of the statute which limits the benefit of the patent laws to things which are *new* as well as useful." (Italics ours.)

The principle applied in the cited case clearly nullifies any advantage which respondents seek to gain from the fact that they have produced a useful device.

Nor is the fact that they were the first to contemplate this use significant. In *Miller* v. *Foree*, 116 U. S. 22, a case involving a patent on tobacco plugs, it was said, per Mr. Justice Bradley, at page 28:

"The application of an old process or machine to a similar or analogous subject, with no change in the

manner of applying it and no result substantially distinct in its nature, will not sustain a patent, even if the new form or result has not before been contemplated."

What patentees are attempting to effect is a monopoly in the use of the Rutz hood 8 as a flame guard for highway warning signals, but it is the device alone which can be patented, and not its use. This was clearly pointed out in *Knapp* v. *Morss*, 150 U. S. 221, a case involving the patentability of an adjustable dress form, where it was said, per Mr. Justice Jackson, at pages 227-228:

"* * * But it is well settled by the authorities that the end or purpose sought to be accomplished by a device is not the subject of a patent. The invention covered thereby must consist of new and useful means of obtaining that end. In other words, the subject of the patent is a device or mechanical means by which the desired result is to be secured. (Citations omitted.) Tested by these authorities, the validity of the patent in question must be ascertained, not from a consideration of the purposes sought to be accomplished, but of the means pointed out for the attainment thereof, and if such means, adapted to effect the desired result, do not involve invention, they can derive no aid or support from the end which was sought to be secured. All that Hall did was to adapt the application of old devices to a new use. * * *"

Petitioner's expert testified on this very point, that if the Rutz hood 8 were transferred to a torch body: "All the principles of operation would remain the same." (R. 127, RDQ 339.)

We have already quoted the trial Court's finding on this point. The Circuit Court argued that even though the Rutz apparatus would accomplish the functions and results of the patent in suit, the patented structure must be considered as an entirety, and that as Rutz had never been used in combination with a torch body to produce the result of the patent in suit, respondent was entitled to a patent thereon. Such a holding clearly does not square with the principles just referred to, and cannot be substantiated under either the facts or the law.

Respondent has heretofore argued that such cases as *Potts* v. *Creager*, 155 U. S. 597; *National Cash Register Co.* v. *Boston Cash Indicator*, 156 U. S. 502; and *Hobbs* v. Beach, 180 U. S. 383, justify sustaining the validity of the patent in suit.

None of the cases which they cite, and others similar in principle which may be found in the decisions of this Court, can be applied to the instant case. In no instance can the prior art devices referred to in those cases actually be used without change for the purposes of the patent. The facts of *Hobbs* v. *Beach*, 180 U. S. 383, are typical. The question concerned the validity of a patent on an automatic box-making machine. The closest anticipation was a certain machine known as the Dennis and York Machine, used in the prior art for pasting labels on newspapers. Of this, it was said, per Mr. Justice Brown, at pages 392, 393:

> "By changing the flat head and flat platen to clamping dies with diverging faces, and strengthening and changing the machine in some minor particulars, it could be used to fasten stay-strips to box-corners. Indeed, a model of the Dennis and York Machine so altered, was put in evidence, and shown to be capable of doing the work of the Beach patent, though somewhat crudely and imperfectly. * * *"

Such a case has clearly no applicability to the instant case. *The Rutz hood 8 requires no alteration whatsoever.* Instead of doing the work "crudely and imperfectly," it *meets every requirement of very rigid state laboratory tests.* And in its use either on a gas stove or on a highway flare, it *was first and last a flame guard.*

The Court below refers to *Rockwood* v. *General Fire Extinguisher Co.*, 2nd Circuit, 8 F (2nd) 682, in which it held valid a dry pipe valve for a sprinkler system. Defendant in that case owned a certain Crosby patent which it claimed anticipated. By eliminating a vacuum element, the Crosby patent could be made to function similarly to the patent in suit. The Court, however, pointed out, page 686, per Judge Manton:

> "The tests made prove that the Crosby valve without the vacuum was inoperative fifty per cent. of the time. The appellant's valve has never failed and has a record of one hundred per cent. Therefore, even modifying the apparatus of Crosby, it was not a successful device, and would not be capable of commercial use for fire extinguishing."

Thus the authority relied on by the Court below is really an authority in favor of petitioner. The Rutz device, without change, will qualify in one of the most difficult states, Nebraska. Its performance, like that of the device of the patent, is one hundred per cent. according to testing standards.

Nor does the fact that the Rutz hood 8 was used to protect the flame on a gas stove require us to consider the analogy of the arts here involved, although that hood and the dome-shaped cap of the patent in suit are both structures in the art of protecting flames from being extinguished. It was pointed out in the Second Circuit case of

Dwight & Lloyd Sintering Co. v. *Greenawalt*, 27 F (2nd) 823, per Judge L. Hand:

> "The use for which the apparatus was intended is irrelevant if it could be employed without change for the purposes of the patent; the statute authorizes the patenting of machines, not of their uses."

V.

If it be the holding of the Court that the Rutz hood does not anticipate claims 11 and 12, then petitioner's device does not infringe, since it is using the Rutz hood in its device.

It was found by the trial Court that petitioner was using a flame guard similar to one manufactured by the Milwaukee Gas Specialty Company (owners of the Rutz patent), except as to the size of the flame ports, and the Court further found that the difference between petitioner's structure and the Rutz structure in the size of the flame ports was immaterial (R. 430, Finding 7).

Petitioner adopted this type of flame guard about July, 1934, and it has been using it ever since. It is not disputed that this structure is adequate to meet all of the rigid requirements of the various state testing laboratories. The trial Court's finding on this subject was not disturbed by the Circuit Court of Appeals.

The facts here set out justify the application of the well-known axiom: "That which does not anticipate cannot infringe," in the event the Court should be of the opinion that the Rutz hood 8 does not anticipate claims 11 and 12 of the patent in suit.

Cases in which this axiom was applied are *Peters* v. *Active Mfg. Co.*, 129 U. S. 530; *Grant* v. *Walter*, 148 U. S. 547, 553, 556; *Knapp* v. *Morss*, 150 U. S. 221, 226; *American Fruit Growers, Inc.* v. *Brogdex Co.*, 283 U. S. 1.

The anomaly of the situation would be clearly brought forth in a theoretical suit by respondent against the Milwaukee Gas Specialty Company, which has been manufacturing and selling the Rutz hood since 1914. Three of these hoods were furnished by the Milwaukee Gas Specialty Company, placed on torch bodies, and submitted to the State of Nebraska for qualification. This constituted a use. Claims 11 and 12 refer to the flame guard alone, and the Milwaukee Gas Specialty Company's product was being used as "a burner for a construction torch adapted to emit luminescent flame."

Were it supposed that the Milwaukee Gas Specialty Company, having the necessary dies and other equipment, decided to manufacture torches using its hood, can one think for a moment that it would be guilty of infringement of the patent in suit? Such a supposition strains one's sense of proportion, yet it is the one which the Court below sanctioned, since the finding of the trial Court that petitioner was using the Rutz hood was not disturbed.

The axiom which we here seek to apply is founded upon the social necessity of protecting conscientious manufacturers who utilize the prior arts. In the majority of patent cases, the Court finds the defendant extolling the virtues of the prior art, while it uses the patented structure. Such a case is *Rockwood* v. *General Fire Extinguisher Co.*, 2nd Circuit, 8 F (2nd) 682, relied on by the Court below, in which the defendant claimed a certain Crosby patent which it had owned but not used for twenty-two years, anticipated. Such is not the instant case. The petitioner's manufacturer believes sufficiently in the efficacy of the prior art structure upon which it relies to use it, and it has been doing so for almost five years.

VI.

Infringement can be found only through a departure from the theory of the specification and by construing the claims to extend beyond the invention; as construed by the Court below the claims are clearly void.

In considering the question of infringement, which in the instant case is inextricably bound with the question of validity under the prior art, the Court's premise was:

> "No statement in the claims or specifications requires that the cap rest directly on the body of the torch nor that the air inlet ports be located in the body of the cap."

Petitioner justifies its argument of non-infringement upon the proposition that it has raised its flame guard above the top base of the torch body and placed its air ports in a horizontal flange below the cap, whereas every suggestion of the patent and the claims, if read carefully, is that the flame guard be mounted on the top base of the torch body and that the air inlet ports be vertically positioned in the side of the cap.

Petitioner's method is the sensible way to design the structure because it results in an upward draft of air, by reason whereof petitioner obtains a much better performance than respondent at a very low wind velocity. It was admitted by one of the patentees that respondent's device did not work so well in calm weather (R. 35, f. 103) and the reasons for this were pointed out by Dr. Luckiesh in his statement that "air does not like to turn sharp corners" (R. 91, Q 133), which it would have to do to function at low wind velocities in respondent's structure.

The structural differences are therefore significant, from the point of view of performance, and in holding that they

had no significance on the question of infringement, the Court below permitted respondent to depart from the theory put forth by its patentees in the patent specification.

The specification states (p. 1, ll. 78-87):

> "Air inlet openings 10 *being above the lower edge of the cap* leaves a space within the cap *and above the flange* of the wick holder for comparatively quiescent air. This quiescent layer of air in contact with the wick holder and the restriction of inlet ports to admit to the wick and holder only such air as is needed for combustion aids in maintaining the heat of the wick holder and wick." (Italics ours).

If the device is to operate as patentees have described it, the air inlet ports must be *above the edge of the cap*. They are not so positioned in petitioner's structure.

In the recent case of *Schriber-Schroth Co.* v. *Cleveland Trust Co.*, 305 U. S. ...., Nos. 3-5 October term, 1938, decided November 7, 1938, well-recognized principles, which were overlooked by the Court below, were again stated by Mr. Justice Stone:

> "The object of the statute is to require the patentee to describe his invention so that others may construct and use it after the expiration of the patent and 'to inform the public during the life of the patent of the limits of the monopoly asserted, so that it may be known which features may be safely used or manufactured without a license, and which may not': *Permutit Co.* v. *Graver Corp.*, 248 U. S. 52, 60. It follows that the patent monopoly does not extend beyond the invention described and explained as the statute requires, *Permutit Co.* v. *Graver Corp.*, *supra*. That it cannot be enlarged by claims in the patent not sup-

ported by the description, *Snow* v. *Lake Shore M. S. R. Co.*, 121 U. S. 617, cf. *Smith* v. *Snow*, 294 U. S. 1 • • •."

In the case of *Snow* v. *Lake Shore M. S. R. Co.*, 121 U. S. 617, quoted by Mr. Justice Stone, it was said, per Mr. Justice Matthews, at page 630:

"On this appeal, it is argued, • • • that this construction of their patent is too narrow; and it is now contended that the detachment of the piston and piston rod is not an essential part of the description and claims of the invention patented. We cannot, however, but agree with the Circuit Judge, that the language of the specification limits the first claim to a combination in which the piston and piston rod are detached from each other • • •

"It is not admissible to adopt the argument made on behalf of appellants, that this language is taken as a mere recommendation by the patentee of the manner in which he prefers to arrange these parts of his machine. *There is nothing in the context to indicate that the patentee contemplated any alternative* for the arrangement of the piston and piston rod • • •." (Italics ours.)

So, in the instant case, there is nothing in the patent specification whatsoever suggesting "any alternative" for the positioning of the air inlet openings above the edge of the cap to permit the existence within the cap and above the flange of a layer of comparatively quiescent air. There is no suggestion anywhere in the patent that the structure can operate without this layer of quiescent air. It is equally clear that by reason of the different positioning of the air inlet ports in petitioner's structure, the latter cannot contain any such feature.

The principles expressed in *Mackay Radio & Tel. Co., Inc.* v. *Radio Corp.* .... U. S. ...., decided January 30, 1939, are also applicable. Respondent has attempted "to broaden the only invention described in the application" by rejecting its theory that the air inlet ports must be in the side walls of the cap and above the flange to create the layer of comparatively quiescent air.

That it is bound by the theory of the specification is shown in the Second Circuit case of *St. Pierre* v. *Redpath etc. Co.*, 87 F (2nd) 766, involving an anti-skid strap for a tire, which, the specification said, should be drawn as tightly as possible around the tire. It was said, per Judge Manton, at page 767:

> "(The inventor) cannot now state that his commercial unit is applied loosely to the wheel and claim this as a patentable feature of his invention, *since it is inconsistent with his patent description.*" (Italics ours.)

Equally is the omission of a "layer of comparatively quiescent air" inconsistent with the description of the instant patent.

The Court below likewise relies upon the statement in the specification that the description "is by way of illustration and not of limitation," to give the claims breadth. This is the trite phrase found in most patent specifications. If it has any effect, it is as a claim to equivalents, and the Ruta hood 8 being a known equivalent, such a claim would nullify the patent.

A preferable alternative is to indulge the presumption that patentees designed their flame guard, mounted on the top base of the torch body with air inlets in the side walls and a layer of comparatively quiescent air, in the light of the Ruta hood 8 in an attempt to escape the necessary invalidity of their patent which the prior existence of the

Rutz hood 8 requires. The presumption is not a violent one since 15,000,000 of the Rutz hoods went into public use.

But respondent, in its grasp for a monopoly, wants all-inclusive coverage, even to the extent of stretching its claims to the breaking point.

VII.

CONCLUSION.

As a summary, all that patentees did was add a flame guard to McCloskey's open flame torch which it had been manufacturing. Their purpose was to protect the open flame of the McCloskey burner from wind and weather.

Except in periods of high winds, the open flame torch was more efficient as a highway warning signal than respondent's device. In a high wind, the protected torch burns with a blue flame—not the luminescent flame of the patent claims—and is of little value as a warning signal (R. 215, XQQ 82, 84). (This undoubtedly accounts for the low candle readings at fourteen miles per hour and more [see graph, Fig. 37, R. 403]. The readings at fourteen miles per hour with and without flame guard were 1.82 and 1.02 foot candles, respectively, and with flame guard at 25.6 miles per hour, 0.22 foot candles; at 4.73 miles per hour respondent's device with flame guard developed 10.22 foot candles, R. 408, Items, 23, 24, 25 and 44).

Under such circumstances, the flame guard's only value is to keep the flame lit until the wind abates. Under all conditions, the cap, like any umbrella, tends to prevent a deluge from drowning the flame.

The art of protecting open flames from wind or weather is as old as civilization, as the Court will see from the record, and must know from the lamp and hydrocarbon

burner art. As we have shown, the Rutz hood 8 met all the problems before patentees became interested in the torch industry, and it can be substituted without change for respondent's structure, accomplishing the identical purpose with entire efficiency.

Giving to patentees the most favorable view of their patent, the alleged invention consisted in taking from the well-known gas burner art a structure the purpose of which was to protect an open flame from extinguishment by currents of air and falling liquids, and combining this structure with the well-known McCloskey torch.

No such development has ever been recognized by this Court as rising to the dignity of an invention entitled to the monopoly given by the patent law.

All of which is respectfully submitted.

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FEB 23

IN THE

Supreme Court of the United States

October Term, A. D. 1938

No. 603

MONTGOMERY WARD & COMPANY, INC.,
an Illinois corporation,

Petitioner,

vs.

THE TOLEDO PRESSED STEEL COMPANY,
an Ohio corporation,

Respondent.

BRIEF FOR PETITIONER IN REPLY TO BRIEF FILED BY RESPONDENT FEBRUARY 11, 1939.

CARL V. WISNER,
Solicitor for Petitioner.

ANTHONY WILLIAM DELLER,
CARL V. WISNER, JR.,
Of Counsel.

McCORMICK AND HENDERSON, INC., CHICAGO

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BRIEF FOR PETITIONER IN REPLY TO BRIEF FILED BY RESPONDENT FEBRUARY 11, 1939.

Foreword.

Respondent herein, petitioner in Nos. 166, 167, filed an original brief on February 11, 1939, entitled not only in the latter causes, to which petitioner herein is not a party, but in this cause as well. It is understood that respondent herein intends to file a supplemental brief, not only in causes Nos. 166, 167, but also in this cause, after respondent's brief in causes Nos. 166, 167 has been filed.

Respondent's brief filed herein seeks to sustain the judgment of the Second Circuit by reference to both records. The treatment of the subject by respondent is so manifestly unfair that petitioner is prompted to file this brief in order that the errors assigned in the instant case may be fairly presented. Further, in some respects, respondent has de-

parted from the record and proceeded *ad libitum*, governed only by its own impressions, to which vagaries, it is felt, the Court's attention should be called.

Unless otherwise specified, references are to the Second Circuit record.

Reply to p. 8, respondent's brief.

Respondent states, at the top of p. 8, that the District Court in the instant case "quite properly deferred to the prior decision in the appellate tribunal." This point was also mentioned by Judge Manton when he remarked (R. 449) "The court below felt obliged to follow" the Sixth Circuit decision. Such an inference is not to be drawn from the opinion filed by the District Court (R. 424-430). Judge Simons' decision turned principally upon the question of mechanical skill under the prior art. The District Court below reached a similar conclusion upon different evidence. The Court, however, further found the following:

1. That claims in suit were aggregative.
2. That petitioner was using a prior art device.
3. That such prior art device might be employed without change for the purposes of the patent.
4. That the prior art device met the qualification tests of highway commissions.

Thus respondent's conclusion that Judge Moscowitz deferred to the Sixth Circuit decision is not borne out by his findings.

Under point "1" of "Summary of Argument" respondent has made an admission which precludes any possibility of validity of its patent. This admission is that old or prior art elements can be operated to produce the results of the patent in suit, although they may not have been used

prior to the patent for such a purpose and were not originally intended to be used for such purpose. Petitioner has discussed the law bearing upon the application of old devices to new uses on pp. 53-59 of its original brief. Respondent's admission at this point forcibly brings into effect the rules cited by petitioner.

Reply to pp. 12-13, respondent's brief.

Respondent here quotes at length from the opinion of Judge Manton, below, wherein he sought to differentiate the Rutz patent as an anticipation from the patent in suit. It is believed all reference to the Rutz specification, insofar as it discusses the Rutz device as a flash igniter, is unnecessary, and can only tend to confuse the issues.

The significant feature of Rutz is the hood 8, and the supporting spider or flange 6, which have the same principles of operation as the flame guard of the patent in suit, (R. 127, f. 379; see Petitioner's Brief, p. 7).

Toward the bottom of p. 12 respondent quotes from the opinion of Judge Manton:

> "In the Rutz patent there is no means for heating the cap if its use there were desirable."

Both Judge Manton and respondent have ignored the testimony of Dr. Luckiesh, petitioner's expert, on this point, as follows, (R. 111): "XQ 277. You understand that that cap is not to be heated at all, in other words, that the pilot is so positioned that it does not heat that cap? A. Of course it is not so, because all you have to do is put your hand on it."

The quotation from Judge Manton at the bottom of p. 12 of respondent's brief, in reference to the importance of heating the cap of the patent in suit, should be considered in the light of the quotation from *Carlton* v. *Bokee*, 17 Wall.

463, set out on p. 40 of petitioner's brief, as well as in the light of the disclosures in Dr. Luckiesh's work on Artificial Light, and in the Malcov specification, referred to on p. 49 of petitioner's brief, and to the following statement of respondent's expert on cross-examination (R. 222):

> "XQ 241. Ordinarily, however, without some particular attention being directed to insulating or some other feature of that kind to prevent the wick tube from becoming hot, it becomes hot as a matter of course?
>
> A. You can design a thing for it to become hot, and you can design for it not to become hot, prevent it from becoming hot, and you can let it alone to take its own course. You can do any of these three things."

In view of such facts, any claim to invention in this feature is ill-advised.

The statement of Judge Manton, quoted at the top of p. 13 "Rutz had no problem of maintaining the flame under conditions of wind and rain" is contrary to definite evidence offered by petitioner that Rutz designed his device to protect his flame from wind and the equivalent of rain, the difference as to rain being one of degree only (R. 393, f. 117).

Reply to p. 14, respondent's brief.

Here respondent seeks to make something of a play upon phraseology between "principles of operation" and "function." After twice having stated that the "principles of operation remain the same," when queried whether there was any change in function when the Rutz hood was transferred from a flash igniter to a torch body, Dr. Luckiesh finally stated that the function is different.

It is obvious that Dr. Luckiesh understood that the cross-examiner by "function" meant "use." If he had been informed that by "function" the *abstract effect* of a device

was meant (see *Corning* v. *Burden*, 15 How. 252), the expert would have continued to answer, "The principles of operation remain the same."

Reply to p. 15, respondent's brief.

At the top of p. 15, respondent seizes upon Dr. Luckiesh's statement that he never associated the Rutz hood with wind. Nothing ever prompted Dr. Luckiesh to associate it with wind since he was never concerned with the problem of designing an efficacious highway torch. Any reference to this statement is clearly beside the point.

Reply to p. 16, respondent's brief.

Respondent here tries to support its proposition that Dr. Luckiesh did not understand the Malcov disclosure. It is to be noted that respondent has omitted, where asterisks have been interposed, a portion of the testimony. The omitted portion is as follows:

"XQ 210. Although you had different ideas to start with, eventually, you did come to an agreement? A. As a matter of fact, as I looked it over, I quite agreed with the two others, my first view of it, and they had been studying it.

"The Court: You mean they agreed with you?

"The Witness: No, I found my diagnosis of it checked with what they had concluded, but it is a very difficult thing because it did not describe in words.

"The Court: Did you change your opinion?

"The Witness: No.

"The Court: Did they come around to your opinion?

"The Witness: No. They had the same opinion independently. They asked me what I thought this was

and what that was, and my recollection is that I happened to agree with them."

In view of the foregoing omitted portion, there can be no doubt of Dr. Luckiesh's understanding of the Malcov structure, and of the careful manner in which he reached his conclusion. (R. 78-79; ff. 234-5).

Respondent's reference to the multiplicity of wick tubes in the Malcov structure is beside the point. Malcov had a clever device for snuffing his flame by elevating his burner structure and its supporting tube to cut the flame away from the wick end and its source of fuel supply. Petitioner's model of Malcov is true, but its pertinency would not have been affected if, for convenience, the multiplicity of wick tubes had been omitted from the model.

At the bottom of p. 17, respondent alludes to the omission in the model of the packing of asbestos or other non-combustible material from the wick end. It is to be observed however, that this feature is not made a part of the drawings, which are equally a disclosure with the specification.

Reply to p. 19, respondent's brief.

The "tests" conducted by Dr. Olsen, respondent's expert, are here alluded to. The best explanation of Dr. Olsen's tests that could be elicited on cross-examination was that he set some flares out on the fire escape about the fourth floor of the Brooklyn Polytechnic Institute, watched them burn, *and took his wind velocity observations from the weather bureau report for that day* (R. 236 XQQ 273-280). This is to be contrasted with the care which Prof. Croft used to eliminate all possible variables.

Reply to p. 21, respondent's brief.

Respondent here deprecates the prior art, except Rutz and Kahn, as "paper patents." The fact that 15,000,000 Rutz hoods went into public use indicates that the device was efficacious in protecting the flame of the flash igniter from being extinguished by winds or drafts, or the boiling over of a pot—a more intense precipitation of liquid than any rain.

The fact that the other patents may not have been used is unimportant. The test of an anticipation is "what is disclosed in the specification and made known to the world." *Minerals Separation etc. Corp.* v. *Magma Copper Co.*, 280 U. S. 400, 402, per Mr. Justice Holmes. This must, of course, be equally true of patents used as the basis for the argument that in view of the prior art, only mechanical skill was involved.

Reply to p. 22, respondent's brief.

If, as counsel says, "the problem was to preserve this open, unsteady flame and to maintain it under all kinds of weather conditions, without enclosing it", the answer is to be found in the Rutz hood 8, and the precise suggestion of how it might be done is found in Wall. (R. 344). Of course the Malcov drawing (R. 325) shows a guard protecting an "open, unsteady flame", whose source, like the flame of the patent in suit, is the end of a wick within the guard.

Reply to pp. 23, 24, respondent's brief.

When one analyzes the "unexpected results" discovered by Dr. Olsen, summarized in points 1 to 4 on these pages, one wonders whether first, patentees discovered that kerosene must be raised to the flash point before it will ignite,

and that in this respect it differs from gasoline and coal gas; second, whether they discovered that any metal surface about which a flame is playing will become hot, with an ensuing flow of heat to the colder portions, and that if these colder portions are in contact with a wick tube leading into a fuel reservoir, the temperature of the fuel in the reservoir will be raised.

Respondent cannot seriously contend that these "unexpected results" were discovered by patentees, and patentees supposed inventive act is thus relegated to the discovery that the Rutz hood 8, or its equivalent, if placed around a wick tube, will protect a flame from wind and rain. Since Rutz, and not patentees, was the first to discover that his hood would satisfactorily protect a flame, the award of a patent for changing the environment of the Rutz hood 8 from the kitchen to the highway must be a nullity.

Reply to p. 25, respondent's brief.

Respondent here emphasizes Dr. Olsen's remark that the Anthes and the Toledo flares were as alike as "two peas in a pod." Considering Dr. Olsen's testing methods referred to above in reply to p. 19 of respondent's brief, which comprised setting the flares out on a fire escape, he may actually have reached such a conclusion. This testimony, however, must be weighed in the light of the witness' limited opportunity for observation.

Reply to p. 28, respondent's brief.

On the question of the supposed fuel saving, the Court is respectfully referred to pp. 17-18 and 50-51 of petitioner's original brief.

As we have pointed out, respondent has never given the proposition a fair test, so the only reliable information on

the subject is petitioner's evidence. Judging from its brief, respondent evidently believes that reiteration of its premise will overcome that premise's unsound foundation. But such a premise cannot be accepted as a postulate for the award of the monopoly which petitioner is here seeking.

Any oil saving which respondent's patentees accomplish has resulted from shortening the height of the wick, which can be done as well with the open-flame torch as with one to which a flame guard has been added. It is the common experience of anyone who has ever used a kerosene lamp or lantern, that if the wick is raised too high, unwarranted consumption of fuel is the natural result.

Public acceptance has been discussed on p. 47 of petitioner's original brief. Licenses, mentioned by respondent on p. 29, carry but little weight, (see *John E. Thropp's Sons Co. v. Seiberling*, 264 U. S. 320, 330) and as the present controversy indicates, three substantial manufacturers have refused to accept licenses on respondent's terms.

On p. 39, respondent characterizes its royalty of three cents per burner as "low." Such, naturally would be respondent's conclusion, although the record contains no opinion evidence to support it.

Respondent sells its torches at $16.00 per dozen; less fifty and ten per cent. (R. 26, f. 78) which is about sixty cents each. The three cents per torch is a five per cent. royalty, which is high, by any standard, at respondent's prices. It is particularly distasteful to a manufacturer when one considers that use of the Rutz hood 8 is open to anyone, and that it is equally capable of qualifying under the severe tests passed by the burner of the patent in suit.

It is to be observed that the three cent per burner royalty is a constant. It's tendency is to create an artificially high price structure. The record does not disclose at what price petitioner sells its flares, but if that price be forty cents, instead of respondent's sixty cents, the royalty becomes

seven and one-half per cent. instead of five per cent., which latter rate is without any economic justification.

Reply to pp. 30-39, respondent's brief.

The supposition that others were unsuccessful in working out the problems solved by respondent's patentees is discussed at length on pp. 15-17 and 43-47 of petitioner's original brief. We may add that such an argument was considered in *Paramount-Publix Corp.* v. *American Tri-Ergon Corp.*, 294 U. S. 464, 476, where it was said, per Mr. Justice Stone,

> "The bare fact that several inventors, in the early stages of sound reproduction, working independently, of whose knowledge and skill in the photographic art we know little or nothing, failed to resort to a method well known to that art, for printing a combination film for which there was then no generally recognized need, does not give rise to the inference of invention."

The facts here are somewhat parallel, and it is submitted equally that no "inference of invention" should result from the activities of either Currie or Kerwin, the first of whom failed to pursue a thought which he admitted must have been in his mind (R. 175, f. 523) and the second of whom made but one experiment.

Reply to pp. 35-36, respondent's brief.

Respondent lays much stress upon the presumption of validity referred to by Mr. Justice Cardozo in *Radio Corp.* v. *Radio Engineering Laboratories*, 293 U. S. 1, 2, 7. The facts of the instant cases are not those which Mr. Justice Cardozo was considering in the quotation in the footnote at the bottom of p. 36. The defense interposed in the *Radio Engineering* case was that De Forest's patents were in-

valid because of prior invention by Armstrong. Prior adjudications of interference proceedings had been adverse to Armstrong, the matter had been relitigated in two additional actions by other parties to compel the issue of patents, and Armstrong was again seeking to relitigate it in the *Radio Engineering* case on substantially identical evidence. Such are not the facts of the instant cases.

It is submitted, however, that no presumption of validity exists in the instant cases, although the point here raised has never before been passed on by this court, so far as we are able to determine from the reports.

None of the patents relied on by petitioner in No. 603, and only one of the five patents referred to by Judge Simons in his opinion, were considered by the Examiner during the prosecution of the patent in suit. It has been repeatedly held by Circuit Courts of Appeal that there is no presumption of validity as against art not cited in the patent office. See *Butler Mfg. Co.* v. *Enterprise etc. Co.*, 8th Cir., 81 F. 2d 711, 716; *Mettler* v. *Peabody Eng. Corp.*, 9th Cir., 77 F. 2d 56; *Elliott & Co.* v. *Youngstown Car Mfg. Co.*, 3d Cir., 181 F. 347, 349; *American Soda Fountain Co.* v. *Sample*, 3d Cir., 130 F. 145, 149; *Westinghouse etc. Co.* v. *Toledo etc. Co.*, 6th Cir., 172 F. 371, 392; Walker on Patents (Deller's Ed.) Vol. 3, p. 2009, Sec. 701.

Reply to pp. 36, 37, respondent's brief.

Respondent complains of being "a small company located in Toledo, Ohio," lacking the "corps of engineers" with which industry is ordinarily armed. While respondent's location in Toledo is to be inferred from its name, the record is silent on its size or industrial importance, as it is equally silent on the size or importance of Anthes Force Oiler Co., which manufactures the accused device herein.

As to the "corps of engineers", patentee Close, an officer of respondent, admits to being an engineer (R. 40, f. 120), which adds to respondent's industrial stature.

Respondent does not explain, however, what bearing the suppositions here referred to have on the validity of the patent in suit. If a patent's validity varied in inverse proportion to its owner's industrial importance, the proposition might be pertinent.

Reply to pp. 40-43, respondent's brief.

In the middle of p. 40, as to the Bolser, Kari-Keen and Anthes flares, respondent states they differ from its flare "only in that the guard in the infringing devices has been elevated a short distance above the fuel tank and the air inlet openings placed in the flange which supports the cap instead of in the sides of the cap."

This is not a true description of the Bolser and Kari-Keen devices, each of which has its air inlet openings in the side of the cap. This is clearly shown in the drawing of the Bolser flare on p. 319 of the record in the instant case and of the Kari-Keen flare on p. 321; the Anthes flame guard, like Rutz, has its air inlet holes in the supporting flange as respondent describes.

Respondent admits that the Anthes structure differs from that of the patent. These differences are completely pointed out on pp. 21-23 of petitioner's original brief. The performance as well as the structures are different and we believe petitioner's discussion of infringement on pp. 61-65 adequately covers the points.

It is to be observed from respondent's discussion of infringement, however, that respondent in its brief has resorted to Judge Hahn's theory that the patent in suit's "main purpose and teaching" is to "protect the flame at its source."

Judge Hahn, of course, did not have the benefit of petitioner's evidence in the instant case that the Rutz hood 8 likewise protected the flame at its source. Nor had Judge Hahn the benefit of the Malcov and Wall disclosures. Whether he would have held to his premise in view of such evidence is very doubtful.

Whatever "the main purpose and teaching" of the patent in suit was, obviously, in view of the Rutz hood 8, it could not have been "protecting the flame at its source." Any arguments based upon Judge Hahn's opinion must necessarily fail, and in view of the art, infringement can be found only in substantial identity with the structure disclosed in the patent drawing. On p. 40 respondent admits that such identity does not exist.

We submit, therefore, on the question of infringement, that the test used by Mr. Chief Justice Fuller in *Kokomo Fence Machine Co.* v. *Kitselman*, 189 U. S. 8, 24, is applicable here:

> "The machines lack that identity of means and identity of operation which must be combined with identity of result to constitute infringement."

All of which is respectfully submitted.

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SUPREME COURT OF THE UNITED STATES.

Nos. 166, 167, 603.—October Term, 1938.

The Toledo Pressed Steel Company, Petitioner, vs. Standard Parts, Inc.	On Writs of Certiorari to the United States Circuit Court of Appeals for the Sixth Circuit.
The Toledo Pressed Steel Company, Petitioner, vs. Huebner Supply Company.	
Montgomery Ward & Company, Inc., Petitioner, vs. The Toledo Pressed Steel Company.	On Writ of Certiorari to the United States Circuit Court of Appeals for the Second Circuit.

[May 29. 1939.]

Mr. Justice Butler delivered the opinion of the Court.

These are patent infringement suits brought by the Toledo Pressed Steel Company, owner of Withrow and Close Patent No. 1,732,708, issued October 22, 1929, for a burner for use in outdoor warning signals such as construction torches and truck flares. The first two suits were brought in the federal court for the northern district of Ohio. It filed an opinion indicating the facts that it deemed established by the evidence and without formal findings held the patent valid and infringed by the Bolser and Kari-Keen flares respectively sold by the defendants. The circuit court of appeals for the sixth circuit held the patent invalid for want of invention and reversed. 93 F. 2d 336. The other suit was brought in the federal court for the eastern district of New York. It made findings as required by Rule 70½, held plaintiff's patent invalid, and dismissed the bill. The circuit court of appeals for the second circuit held the patent valid and infringed by the Anthes flare sold by the defendant, and reversed. 99 F. 2d 806.

In the interest of plaintiff, seeking to uphold the patent prima facie valid, and of the public, liable to exclusion from manufacture, use, or sale in virtue of the right it purports to confer, final adjudication as to validity is of primary importance. The patent in suit relates to torches for guarding street obstructions and to flares, which are large torches, for warning that vehicles are stopped on the road.

Formerly, red lanterns were much used. But, after general use of automobiles having red tail lights to some extent resembling them, they did not serve so satisfactorily as before. Open-flame torches came to be extensively employed. The motion of the luminescent flame distinguishes them from other signals. But there were complaints that they were sometimes extinguished by wind or rain.

Open-flame torches in use for some years before patentees' claimed invention, included those which were bomb-shaped, flat bottomed; weighted for stability, and with an opening in the top for a wick. That type was well known, at least after the patent covering it, McCloskey No. 1,610,301, was issued December 14, 1926, in 1929 it was held invalid by the circuit court of appeals for the sixth circuit for lack of invention and because anticipated *McCloskey* v. *Toledo Pressed Steel Co.*, 30 F. 2d 12. Plaintiff had a large business in the manufacture and sale of torches, including the McCloskey type. It advertised that they would burn in all kinds of weather; having received many complaints of extinguishment by wind and rain, patentees, respectively plaintiff's president and vice president, set about producing something to make them dependable and to serve as represented. Within a year, but after experiments, trials, and failures, they brought forward the patented device.

The specification states that the claimed invention particularly relates to devices to increase efficiency and to prevent flame extinguishment. It declares that the objects of the invention are to provide a simple attachment to attain those ends and a burner so constructed that liability of extinguishment by wind or rain will be reduced to a minimum. It further says that with the described construction and arrangement consumption of oil and wick is materially decreased.

The claims involved are printed in the margin.[1] Considered together, unobscured by artificiality in their statement, it fairly may be said that they show that all that the patentees did was to put over the wick of a torch, well known in the art, an inverted metal cuplike cap having holes in its sides, some to let in air for combustion and others to let out flame. The cap was also well known and had been used as a part of other devices for the protection of kerosene and other flames.

A number of devices patented earlier than plaintiff's included the elements essential to its burner.

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[1] In all the cases, claims 2, 5, 11 and 12 are involved. In Nos. 166 and 167, claim 13 is also involved. In No. 167, claims 1, 6 and 7 are also involved.

1. In a device of the class described, a torch body having an opening at its upper end, a wick-receiving tube extending into said opening, and a cap disposed on the outer side of said torch body to enclose the outer end of the wick, said cap having an imperforate upper wall, lateral flame openings, and air openings below the flame openings.

2. In a device of the class described, a torch body having an opening for a wick, and a flame guard for said wick mounted on the outside of said torch body, said guard including a cap provided with an imperforate top wall and lateral flame openings adapted to emit a luminescent flame, and air ports.

5. In a device of the class described, a construction torch having an opening in its upper end for a wick, means to hold the wick in place, and a guard fitting over the outer end of the wick but spaced from the sides thereof, said guard having an imperforate top wall and side flame and air openings.

6. In a device of the class described, a torch body having a wick-opening, a tube for receiving the wick and adapted to extend inside of the torch body, an outwardly extending flange in the region of said wick-opening, and a cap connected to said flange and having an imperforate top wall, said cap having a flame opening adjacent its outer end and an air port beneath said flame opening.

7. In a device of the class described, a torch body having a wick-opening, a cap for enclosing the outer end of the wick but spaced from the sides thereof, an imperforate end wall for said cap, said cap having a series of flame openings and a series of air ports beneath the flame openings, and a disc adapted to embrace the wick and having a flanged upper portion disposed in the region of said air ports.

11. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a supporting and heat-receiving flange, and means enclosing a space above said flange and surrounding the wick, except for provision for lateral exit of flame and restricted entrance of air for combustion.

12. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a lateral flange, and a cap enclosing and spaced from the end of the wick and having an imperforate top and provision for lateral exit of flame and entrance of air, and the bottom of the cap being in heat conducting relation to said flange.

13. A burner for a construction torch adapted to emit a luminescent flame and comprising a wick holder having a portion in contact with the wick and a laterally extending flange and a cap over the wick, the cap having an imperforate, dome-shaped top wall, a lateral flame opening approximately even with the top of the wick and a smaller opening for the inlet of air lower than the flame opening and above the lower edge of the cap, said lower edge being in heat-transferring relation to said flange.

Billingham Patent, No. 191,031, issued August 15, 1876, related to torches for lighting street-lamps. It shows a wick-type torch with a tube-like cap having holes, some to let in air, and others to let the flame come out. This cap, imperforate at the top, serves to prevent extinguishment of the flame by wind or rain. Almond Patent, No. 193,796, issued August 7, 1877, related to vapor burners for heating. The device, some parts detached, serves as an illuminating lamp consisting of a body, a wick holder, a cap, a flange having a rim supporting a tube closed at the top. Holes are in the rim to admit air; larger ones in the tube are to let the flames out. Rutz Patent, No. 1,101,146, issued June 23, 1914, covers a flash igniter for gas stove burners. It has a cap to guard the flame and adapted to emit flames extending from the igniter to the gas burners to be lighted. This cap, like plaintiff's, has a supporting and heat receiving flange, a means to enclose the space above the flange and a restricted entrance to admit air for combustion. The record shows that the Rutz hood has been used to achieve the identical results attained by plaintiff's device.

There are other patents, issued before patentees developed the structure in suit, that may be referred to as relevant to the issue of invention in this case. Examples of these are cited in the margin.[2]

The torch body was old in the art to which it belonged. The cap, as part of devices used in other fields, was old and useful to prevent extinguishment of flames by wind or rain and to permit flames to extend through holes to the open air. The problem patentees set for themselves was to prevent extinguishment while preserving usefulness of the flames as warning signals. They solved it by merely bringing together the torch and cap. As before, the torch continued to produce a luminescent, undulating flame, and the cap continued to let in air for combustion, to protect the flame from wind and rain and to allow it to emerge as a warning signal. They performed no joint function. Each served as separately it had done. The patented device results from mere aggregation of two old devices, and not from invention or discovery. *Hailes* v. *Van Wormer*, 20 Wall. 353, 368. *Reckendorfer* v. *Faber*, 92 U. S. 347, 357. *Lincoln Co.* v. *Stewart-Warner Corp.*, 303

[2] Blake Patent, No. 453,335, June 2, 1891. Heston Patent, No. 270,567, January 16, 1883. Beckie Patent, No. 192,130, June 19, 1877. Kahn Patent, No. 1,175,827, March 14, 1916.

U. S. 545, 549-50. On the records before us, it is impossible to hold that production of the patented device required more than mechanical skill and originality attributable to those familiar with the art of protecting flames of kerosene and other burners. *Altoona Theatres* v. *Tri-Ergon Corp.*, 294 U. S. 477, 486; *Powers-Kennedy Co.* v. *Concrete Co.*, 282 U. S. 175, 186; *Concrete Appliances Co.* v. *Gomery*, 269 U. S. 177, 184, 185; *Hollister* v. *Benedict Manufacturing Co.*, 113 U. S. 59, 72-73.

As evidence in its favor on the question of invention, plaintiff cites efforts to find something useful to protect open-flame torches from extinguishment by wind or rain put forth by one engaged in operation of a street railway and by another employed by a manufacturer of lanterns. But it does not appear that either was familiar with the relevant prior art. Nor is there any evidence of general or widespread effort to solve the problem here involved. There is nothing that tends to raise what patentees did to the realm of invention. See *Paramount Corp.* v. *Tri-Ergon Corp.*, 294 U. S. 464, 476. Plaintiff also brings forward the fact that some manufacturers, including three substantial ones, have taken licenses under its patent. It does not appear that these licensees have made wide or successful use of the device. Lack of novelty being clearly shown, acceptance of license under the circumstances of this case, is without weight. *Thorpp's Sons Co.* v. *Seiberling*, 264 U. S. 320, 330. *John T. Riddell* v. *Athletic Shoe Co.*, 75 F. 2d 93, 95. And similarly without significance on the question of novelty is the fact that, as plaintiff claims, utility resulted and commercial success followed from what patentees did. *Firestone Tire & Rubber Co.* v. *United States Rubber Co.*, 79 F. 2d 948, 954.

It results that the decrees in Nos. 166 and 167 must be affirmed, and that in No. 603 must be reversed.

It is so ordered.

Mr. Justice DOUGLAS took no part in the consideration or decision of this case.

A true copy.

Test:

Clerk, Supreme Court, U. S.